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INDIA RUBBER WORLD

Editor
S. C. Stillwagon

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Edward V. Osberg

Volume 99 | November 1, 1938 | Number 2

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Published monthly by Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y. Cable Address, Elbill, New York. Subscription $3.00 per year postpaid in the United States and Mexico; $3.50 per year postpaid to Canada; $4.00 per year postpaid to all other countries.

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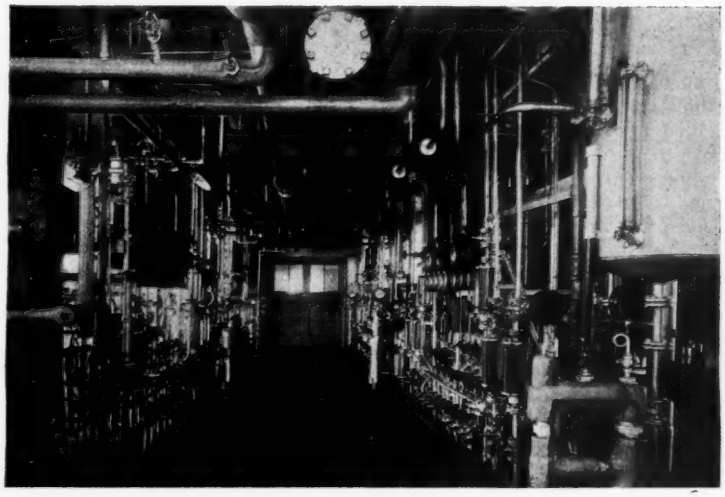
Volume 99 | **New York, November 1, 1938** | **Number 2**

Wetting Action of "Tergitol" Penetrants

New Chemicals Aid Latex Impregnation

B. G. Wilkes and J. N. Wickert [1]

INTEREST in organic compounds which possess surface activity has been growing during the past five years. Industry is becoming increasingly conscious of the importance of the chemistry of surface activity in respect to its aqueous processes and of the advantages to be gained by the use of these many new compounds. That this interest is now greater than ever before is evidenced by the different industries using these polar, surface-active compounds as wetting agents or penetrants. As a result, manufacturers are realizing significant reductions in processing time and improvements in results.



Control Area of Unit Producing "Tergitol" Penetrants

Recent articles in the trade papers[2] mention over 50 trade names of synthetic chemicals that are of interest in processing because they have properties of increasing the wetting ability of water, or lowering the surface tension of aqueous solutions. In order to select from this large group the proper wetting agent for a particular purpose and to determine the optimum amount to be used for best results, the comparative effectiveness of the wetting behavior of many of the commercially available surface-active compounds was studied.[3]

Comparative Wetting Action of Various Products

As a result of this examination of a large group of representative products, the superior wetting efficiency of the sodium sulphates of higher, secondary synthetic alcohols over a wide range of conditions has been established. This group of surface-active compounds has been made available to industry by Carbide & Carbon Chemicals Corp. under the trade mark "Tergitol;" specific members of this group of sodium secondary-alcohol sulphates are designated as "Tergitol" penetrant 7, "Tergitol" penetrant 4, and "Tergitol" penetrant 08.

Remarkably effective as wetting and emulsifying agents, the "Tergitol" penetrants display an unusual degree of surface activity even when used in extremely low concentrations. Each of these products is soluble in dilute solutions of acids, alkalies, and salts and is completely stable under ordinary temperature conditions. All of them form

[1] Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York, N. Y.
[2] *Am. Dyestuff Reptr.*, 26, p. 569 (1937); C. E. Mullin, *Soap*, Feb., 1938, p. 32.
[3] B. G. Wilkes, and J. N. Wickert, *Ind. Eng. Chem.*, 29, 1234 (1937).

soluble lime salts and therefore are not precipitated by hard water. They increase the hygroscopicity of treated materials and have been adopted in silk soaking and other processes for softening fibers.

The most widely used method for evaluating wetting efficiency is that of Draves and Clarkson,[4] as accepted by the American Association of Textile Chemists & Colorists.[5] It entails determination of the time required for 5-gram skeins of two-ply unboiled cotton yarn to sink when weighted with a 1.5-gram sinker and submerged in wetting agent solutions by means of an anchor. When observed sinking times are plotted on a log-log scale as a function of wetting agent concentrations, a straight-line relation is obtained. The results of such wetting tests, covering a sensible range of wetting agent concentration, are presented in the charts. The curves were obtained by the use of commercially available penetrants in the form in which they are marketed and are separated into two groups, A and B, according to the position of the hydrophyllic or polar groups with respect to the non-polar portion of the molecules. The following table shows the chemical structure of the type-compounds comprising these two groups.

TABLE 1

Type No.	Type Name	Chemical Structure*
A1	Low titre soap	R·COONa
A2	Sulphonated higher alcohols	R·SO_4Na
A3	Fatty acid amide sulphonates	R·CONH$C_2H_4SO_3$Na
A4	Fatty acid ester sulphonates	R·COO$C_2H_4SO_3$Na
B1	"Tergitol" penetrants	R′$_2$·CHSO_4Na
B2	Sulphonated dialkyl succinates	{ R′OOC·CH_2 / { R′OOC·C′HSO_3Na
B3	Naphthalene (aromatic) sulphonates	R′·Ar·SO_3Na

*R=fatty alkyl group; R′=primary or secondary non-fatty alkyl group; Ar=aryl or aromatic group.

As seen from Table 1, compounds in group A are derived from fatty sources, the polar or water-soluble grouping being a primary one, located at the end of the non-polar portion of the molecule. In contrast group B includes the more truly synthetic surface-active compounds, each containing its polar group in a secondary position with the non-polar portion extending from it in two directions. The curves shown in the charts indicate the wetting efficiencies in aqueous solutions of all the products tested that were sufficiently active to produce cotton sinking times of approximately 12 seconds at wetting agent concentrations of 0.6% or less.

From the charts it is seen that wetting efficiency changes considerably with changes in acidity or alkalinity. In some instances this is partially due to the instability of the wetting agent in the presence of acid or alkali. Perhaps, a more important reason for these changes is the variation in effective solubility of the wetting agents and in their properties of surface activity. The most efficient wetting agents are those whose sinking time-concentration curves lie in the region closest to the origin of the axes. The secondary alcohol sulphate product, "Tergitol" penetrant 7, was the most unusual in this respect. The curves reveal that when the aqueous system involved contains less than 0.5% of dissolved materials (acids, bases, salts, dyestuffs, starches, and such), "Tergitol" penetrant 7 is usually found to be most effective. This may be too broad a generalization, since it is possible that "Tergitol" penetrant 4 would be more economical when the concentration of dissolved materials is about 0.5%. In solutions containing higher concentrations of dissolved materials (0.5 to 5%) "Tergitol" 4 has been found to be most effective, and when still higher concentrations are involved, "Tergitol" penetrant 08 is used. It is important to consider the choice of "Tergitol" penetrant as based on the content of dissolved materials rather than on a pH value of the solution.

The curves serve another useful purpose when establishing the money value of a product for wetting-out purposes. The concentration required to provide a 15-second wetting time, for example, will give a basis for computing money values. These curves likewise provide a means of readily determining how much of one product it will take to replace another from the viewpoint of performance. In this connection the procedure of evaluating wetting agents on a plain water basis, without regard to the actual conditions under which they are to be used, is in danger of giving misleading results. It is always desirable to test wetting agents in the solutions in which they are to be used.

Use in Rubber Latex

As one element of the growing interest in these compounds, the use of penetrants in connection with the problems of impregnating with rubber latex has been investigated. It is unfortunate, however, that the standard test described above cannot be utilized when a concentrated dispersion of rubber latex is the wetting medium. Opacity, viscosity, and tendency to coagulate at any air interface are properties of latex dispersions which prevent the use of orthodox methods for determining wetting efficiency. Experimentation has shown that sufficiently precise and reproducible results can be obtained, however, by observing the time necessary for single strands of gray cotton yarn to sink below the surface of freshly stirred, concentrated dispersions of latex containing various concentrations of wetting agent.

Specific application of this general method to the testing of the wetting action of the "Tergitol" penetrants was made by determining the time necessary to wet single strands of gray cotton yarn, one inch long, with concentrated latex which had been freshly stirred so as to expose an uncoagulated surface area. The average results of a plurality of tests of each of the "Tergitol" penetrants at various concentrations are presented in the following table.

TABLE 2

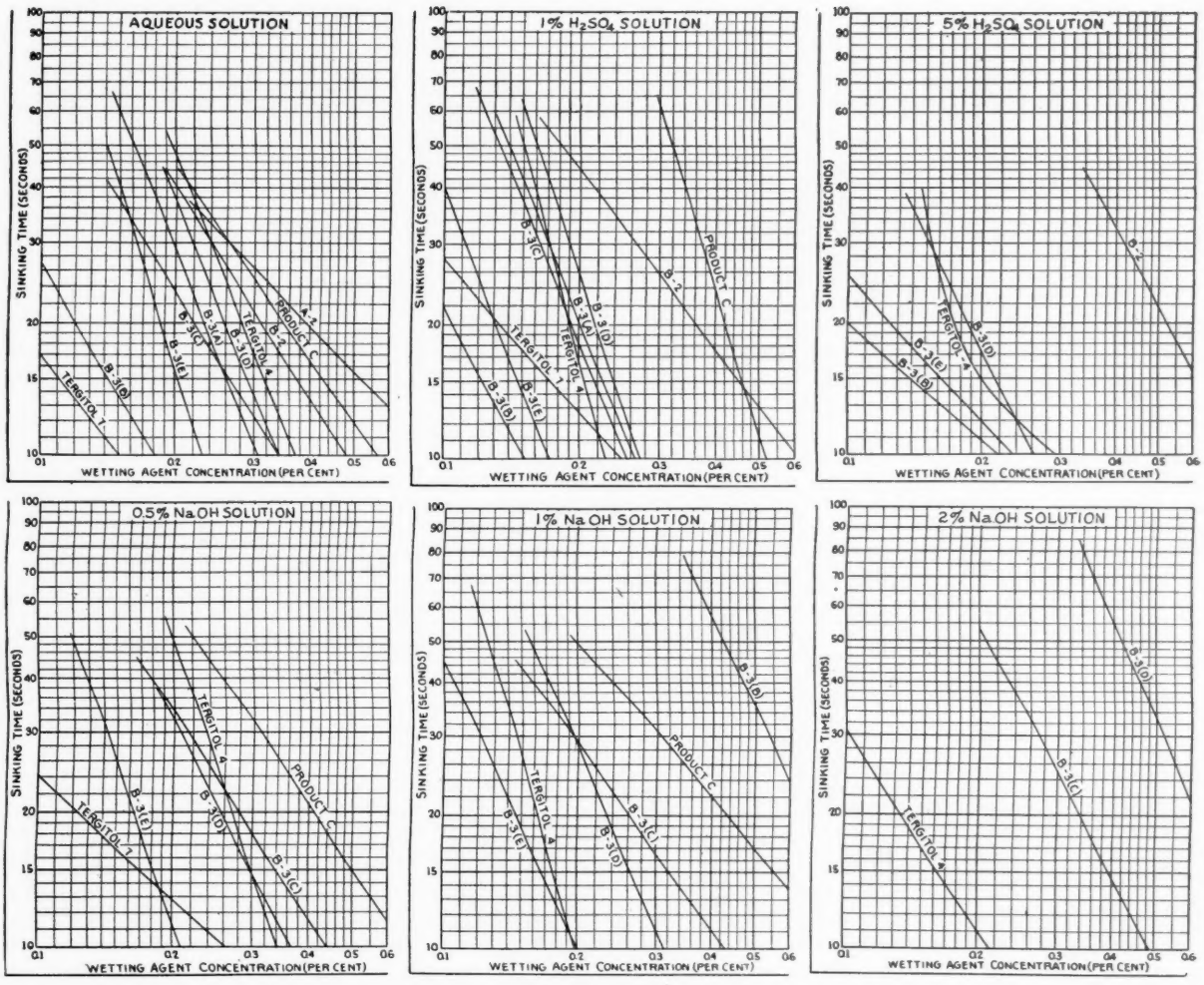
Wetting Agent Concentration	Cotton Strand Wetting Time in 8 to 9% Latex Dispersion		
	"Tergitol" 7	"Tergitol" 4	"Tergitol" 08
%	Sec.	Sec.	
2.00	8.3	8.1	2 min.+
1.50	14.2	14.7	.....
1.00	51.7	50.1	.....
1.50 after 24 hr.	13.9	15.1	.....

Wetting time of latex alone=10 min.+

At concentrations of wetting agent ranging from 1 to 2% "Tergitol" penetrant 7 and "Tergitol" penetrant 4 are shown, by the above data, to be of approximately equal effectiveness and to retain their cotton wetting ability in standing latex baths. Either of these penetrants can be used to promote practically instantaneous wetting of cotton structures without fear of imparting any element of instability to the impregnating latex system.

"Tergitol" penetrant 08 is inferior to the two other members of this wetting agent family in promoting the wetting and penetration of structures which tend to resist latex impregnation. Each of the three "Tergitol" penetrants is of value, however, in combating other problems which are encountered in processing latex. Preliminary wetting of pigments and fillers, through the use of small quantities of the "Tergitol" penetrants, allows ready incorporation into latex mixes of slurries which are normally wettable only with considerable difficulty. Pigment dispersions of increased fluidity and containing less than the usual amount of water can be prepared. These pretreated

[4] Draves and Clarkson, *Am. Dyestuff Reptr.*, 23, 1938 (1934).
[5] American Association, Textile Chemists & Colorists, Yearbook, p. 162 (1935-36).



Cotton Wetting Action of Various Commercial Penetrants in Aqueous, Sulphuric Acid, and Sodium Hydroxide Solutions at 25° C.

pigment dispersions, when subsequently added to concentrated latex, have a minimum diluting effect but, nevertheless, promote a uniform pigment distribution throughout the latex mix. "Tergitol" penetrant 08 has been found to be particularly useful for this purpose.

Other Applications in the Rubber Field

Lubrication of molds for vulcanizing rubber and of forms for latex dipping is an additional meritorious application of the "Tergitol" penetrants. Aqueous solutions for this purpose are very easily prepared because the liquid nature of these wetting agents makes them readily dilutable.

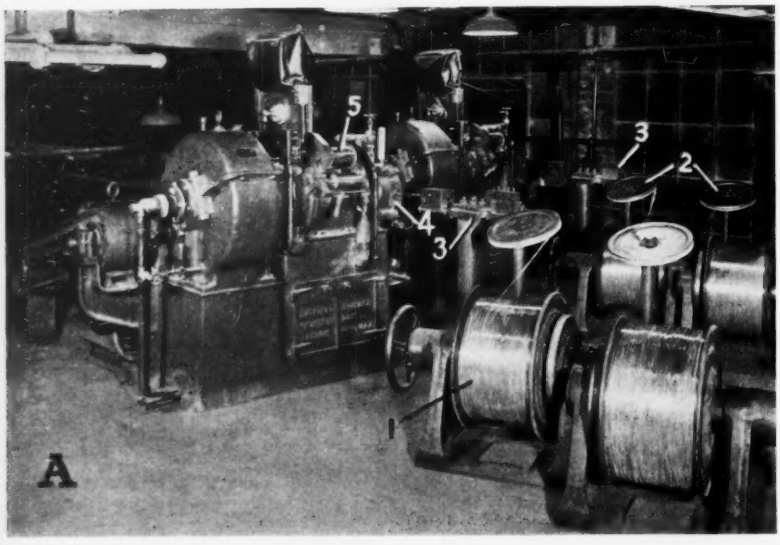
Possessing unique emulsifying properties, "Tergitol" penetrant *7*, in particular, has been found to be a very effective dispersing agent for water-insoluble, low viscosity solvents such as gasoline, toluol, and the chlorinated hydrocarbons. This property may be of interest to manufacturers of rubber cements, as it may enable them to prepare emulsions of rubber solvents. For example, a stable emulsion of trichlorethylene can be prepared by stirring it into an aqueous solution containing from 5 to 10% "Tergitol" penetrant *7* and then diluting the emulsion with water until the desired concentration of trichlorethylene is obtained. Based upon the weight of the solvent, 1 to *2%* of the penetrant is sufficient. Emulsions of chlorinated solvents are extremely difficult to stabilize, but in a test of the given example described above it was noted that the emulsion showed only a slight amount of water separation over a period of 16 hours, and the dispersion was easily restored to complete uniformity after this time merely by slight agitation.

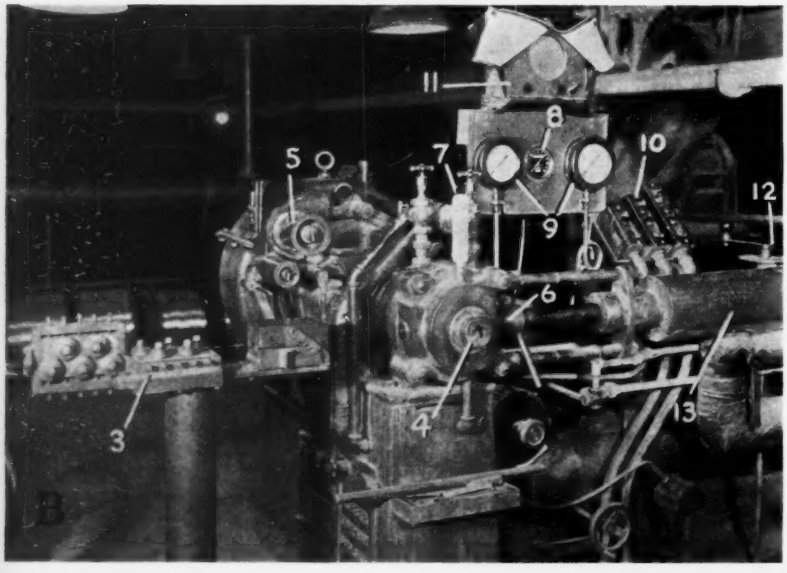
In the "Tergitol" penetrants the rubber industry now has at its disposal extremely surface-active compounds which are unaffected by hard waters and which retain their activity in neutral, acidic, and alkaline solution. Their fluid nature makes them more easily adaptable than solid products to such rubber processes as latex impregation and dipping as well as mold and form lubrication.

WHILE ATTEMPTING TO REMOVE A TRUCK TIRE FROM which the air had not been entirely released, the driver was fatally injured when the outside tire ring, thrown by the expanding air in the tire, crashed into his face. Before a truck tire is removed, the valve stem should be completely removed so no possibility exists of air remaining in the tire. Unfortunately this practice is not always followed, and accidents of the nature just described happen with too great frequency. *N. S. C. News Letter.*

Continuous Wire Insulating

S. C. Stillwagon

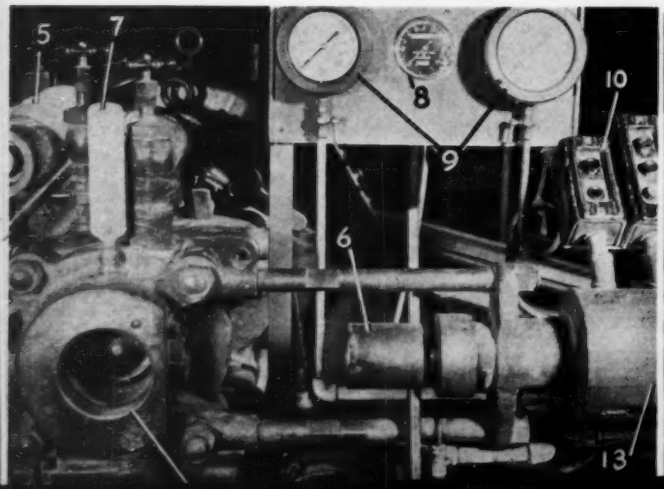


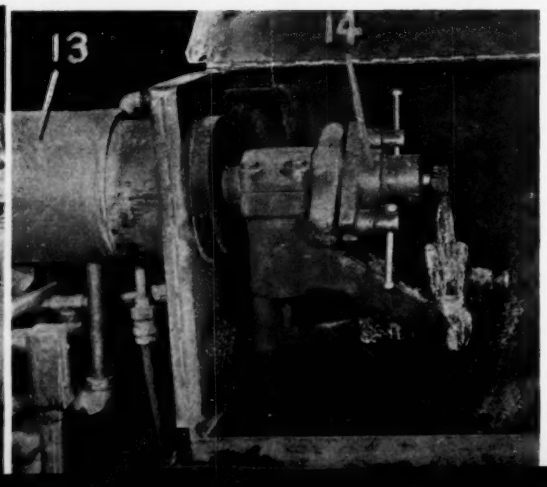


A. Wire-Insulating Extruders with Feeding Equipment
B. Tuber Showing Splice Box and Controls
C. Extruder Head and Splice Box in Open Position
D. Equipment Assembly at Delivery End
E. Sealing Mechanism at Vulcanizer Outlet
F. Cooling Chamber with Tension Capstans

Key to Equipment Numbered in Photographs

1. Supply of Tinned Copper Wire
2. Sheave Wheel for Guiding Wire
3. Wire Straightener
4. Die-Head Where Rubber Is Applied
5. Automatic Rubber-Strip Feeder
6. Splice Box and Steam Seal
7. Die-Head Temperature Thermometer
8. Speedometer Indicating Wire Travel
9. Steam Pressure Gages
10. Push Button Controls
11. Loud-Speaker for Contact with Delivery-End
12. Controller for Synchronizing Speed
13. High Pressure Vulcanizing Tube
14. Sealing Chamber at Tube Outlet
15. Directional Sheave Wheel
16. Dial-Electric Insulation Tester
17. Water-Spray Cooling Chamber
18. Dusting Box
19. Floating Guide Spool
20. Wind-Up Reel for Finished Wire
21. Power Capstans
22. Water Spray Nozzles





g Process

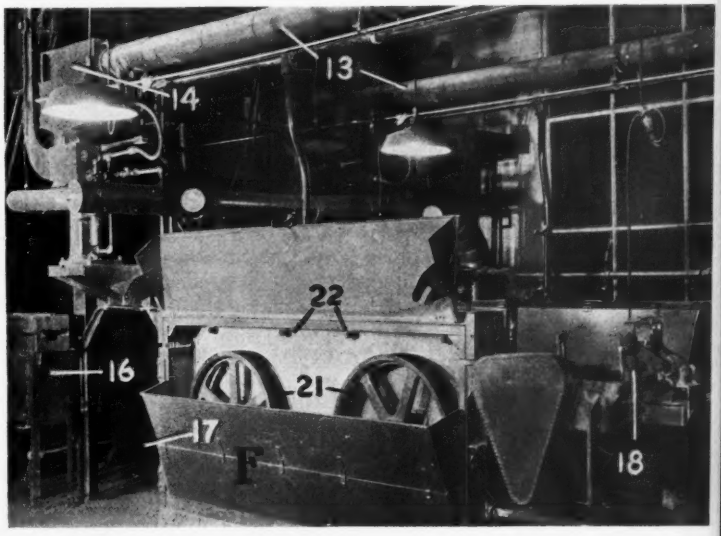
IN KEEPING with modern trends toward the development of accelerated and more highly controllable processes through improved machinery, manufacturers of rubber-covered wire are rapidly replacing the earlier and less efficient methods for insulating the smaller sizes of wire, which process utilized unconnected operations including: the comparatively slow coiling of the covered wire in pans of soapstone; the laborious handling to and from open-steam vulcanizers, and the subsequent winding of the wire on reels for shipment. In the old process the surrounding air was filled with talc dust, which later settled on the equipment and floor, thus resulting in undesirable working conditions.

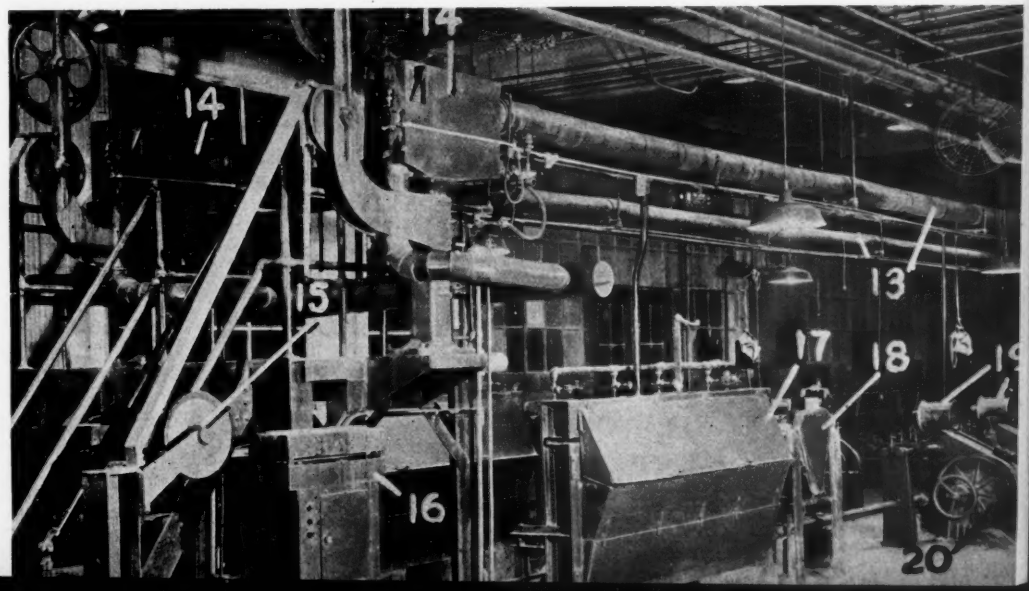
Continuous from the automatic feeding of rubber strips into the extruder to the reeling of the insulated wire for shipment, a recent installation by the Anaconda Wire & Cable Co. consists of two parallel units as shown in the accompanying photographs. This equipment, built and supplied by the National Rubber Machinery Co., represents a marked contrast in production methods from the intermittent procedures formerly in general use. Operating at a normal linear speed of approximately 500 feet per minute for No. 14 solid wire, one unit will produce on the average more than 25,000 feet per hour. Uncovered wire from the supply reels is passed consecutively through: the insulating tuber; a vulcanizing chamber 150 feet in length; a device for continuously testing the electrical continuity of the rubber covering; a water spray and bath for cooling purposes; and a talc dusting box in which revolving brushes remove the excess, following which the finished wire is wound on reels with a 12-inch drum to an outside diameter of approximately 30 inches, each of which contains about 10,000 feet of No. 14 covered wire. Dual supply and take-up reels for each unit eliminate any necessity of stopping the machine at the time of reel change although at times the speed is cut down somewhat.

By means of a Westinghouse Synchro-tie control the reel take-up mechanism and the pulling force exerted on the wire at the capstans in the cooling chamber are synchronized with the tuber so that undue tension is not placed upon the wire. It also aids in producing a uniform coating of extruded insulation rubber. The temperature in the extruder head is regulated by water which circulates through a chamber, the temperature of which is automatically controlled by steam or cold water. The temperature within the die head is continuously recorded on a chart.

Although regulated to be suitable for specific rubber compounds and speeds, the steam pressure within the vulcanizing tube is usually controlled to 220 pounds, thereby producing a temperature of 390° F. Feed line steam pressure is maintained at a maximum required by the machine. Steam control is at the extruder end of the vulcanizing chamber and regulation is effected by automatic pressure recording controllers. The 150 foot vulcanizing chamber or tube consists of an inner tube 1½ inches in diameter, through which the wire passes in live steam, and an outer tubular chamber 2½ inches in diameter. External insulation is built up to an outside diameter of 7½ inches. Steam pressure is maintained continuously in the outer chamber, but a two-way three-port valve admits steam into the inner chamber or exhausts from the inner chamber to the atmosphere when necessary to splice the wire or have access to the die head of the extruder. The steam seal at the extruder end of the inner chamber, shown as No. 6 in photographs B and C, consists of a sliding joint which, when closed, is held against the die by an interrupted thread, the steam backing up against the die. The steam seal at the delivery end of the inner chamber, shown as No. 14 in photograph E, is a device incor-

(*Continued on page* 40)





EDITOR'S NOTES. This process is known as the Western Electric Continuous Vulcanizing Process and is covered by patents owned by the American Telephone & Telegraph Co. and its subsidiaries.

Photographs through courtesy of National Rubber Machinery Co., Akron, O.

Sun Resistance of "Thiokol"[1] DX-Rubber Blends

S. M. Martin, Jr.[2]

SYNTHETIC rubbers are rapidly gaining prominence in the fields of commerce and industry. Their unique properties of withstanding the deteriorating action of oils, gasoline, and commercial solvents coupled with their superiority over rubber in natural aging and sunlight resistance make them applicable to many uses. For example, synthetic lined curb pump hose has gained rapid acceptance. Its greater flexibility and superior wearing qualities have been readily recognized. The use of a rubber cover on this type of hose, while showing superior abrasion resistance to a cotton jacket, does possess the disadvantage of checking or cracking in bright sunlight.

The synthetic rubber sold under the trade name of "Thiokol" Type "DX," when compounded with such pigments as the soft and semi-reenforcing carbon blacks, does not check or deteriorate in bright sunlight during normal periods of exposure in service. These stocks, besides being sun resistant, are highly resistant to deterioration by gasoline, oils, and greases.

However a stock to withstand bright sunlight does not necessarily have to be solvent resistant. It has been found that stocks made from blends of "Thiokol" DX and rubber, while not possessing the high solvent resistance of the straight "Thiokol" DX stock, show promise of having very good sun aging characteristics. We have attempted to determine roughly the amount of rubber that can be blended with a "Thiokol" DX stock and still maintain good sun resistance.

Base Compounds for Test

For this work two rubber stocks of the following composition were selected. These, in various proportions, were blended with a standard "Thiokol" DX mix—No. 2500 DX Compound.

	2000R4	2000R9
Smoked sheets	100.	100.
Zinc oxide	5.	5.
Gastex	88.	88.
Stearic acid	2.0	2.0
Captax	1.25	1.25
AgeRite powder		2.00
Sunproof		1.00
Sulphur	4.00	4.00
	200.25	203.25
2500 DX		
"Thiokol" DX		100
Zinc oxide		8
Gastex		60
		168

It will be noticed that the two rubber stocks contain relatively large amounts of Captax and sulphur. Where a rubber stock is blended with a "Thiokol" DX stock, this high ratio of accelerator and sulphur is necessary to insure proper cure of the rubber phase.

Rubber and "Thiokol" Blends

Blends were made using the 2500 DX with 2000R4 and with 2000R9. In making these blends the "Thiokol" DX and rubber stocks were mixed separately. The "Thiokol" stock was put on the mill, and the pre-warmed rubber stock added slowly in small amounts to the "Thiokol" Type "DX" stock.[3]

In this study were included blends ranging from 100 parts of "Thiokol" DX and no rubber to 100 parts rubber and no "Thiokol" DX. However for simplicity we have limited the data presented here to the range of blends which includes stocks that definitely check and those that do not check in sunlight.

The ratios of the "Thiokol" stock and the rubber stock blended in the different mixes are given in Table 1. Also given in this table are the ratios of "Thiokol" DX to rubber in each of the stocks.

TABLE 1

Stocks without Sunproof and AgeRite

	13	15	16	17	18	12
Ratio of Stocks						
2500 DX	168	168	112	84	63	0
2000R4	0	100	100	100	100	200
Ratio of "Thiokol" DX to Rubber						
"Thiokol" DX	100	100	100	100	75	0
Rubber	0	50	75	100	100	100

Stocks Containing Sunproof and AgeRite

	13	30	31	32	33	36
Ratio of Stocks						
2500 DX	168	168	112	84	63	0
2000R9	0	101	101	101	101	203
Ratio of "Thiokol" DX to Rubber						
"Thiokol" DX	100	100	100	100	75	0
Rubber	0	50	75	100	100	100

Physical Test Results before Exposure

The above blends were cured in test sheets at two different cures and physical strength data obtained on each cure.

The data from these tests are given in Table 2.

[1] Trade Mark Reg. U. S. Pat. Office.
[2] Thiokol Corp., Trenton, N. J.
[3] "Thiokol" DX and rubber can be blended together during the mixing of the batch. In this case well-broken-down and pre-warmed rubber should be used. The rubber should then be added slowly and in small amounts to the "Thiokol" DX. When the rubber has been dispersed in the "Thiokol" DX, the compounding ingredients can then be added.

TABLE 2

Stock No.	Cure Mins./°F.	Moduli 100%	Moduli 300%	Tensile Lbs./Sq. In.	% Elongation	% Set	Hardness (Duro)
13	30/298	395	1000	1260	480	12	75
	50/298	535	1320	1450	410	10	77
15	30/298	380	1210	1495	420	15	72
	50/298	475	1420	1610	360	12	73
16	30/298	410	1320	1560	390	16	71
	50/298	510	1550	1675	340	13	72
17	30/298	440	1495	1730	380	16	71
	50/298	530	1675	1820	340	15	73
18	30/298	445	1585	1820	380	19	72
	50/298	560	1730	1840	340	15	74
12	20/287	625	2670	2760	310	18	72
	30/298	790	....	2440	280	15	76
	50/298	790	....	2440	260	11	76
30	30/298	375	1185	1465	410	16	71
	50/298	480	1400	1580	370	14	73
31	30/298	405	1285	1540	420	20	70
	50/298	465	1460	1640	370	16	73
32	30/298	405	1370	1650	390	18	71
	50/298	475	1535	1695	340	15	73
33	30/298	530	1570	1815	370	15	71
	50/298	550	1770	1910	350	16	73
36	20/287	610	2435	2875	380	24	72
	30/298	730	2600	2750	320	18	73
	50/298	695	....	2610	290	12	73

Sunlight Exposure Tests

Strips one inch wide by three inches long were died out of these test sheets and these tacked to a strip of wood 7/8 by 7/8-inch in cross section to form a loop. The radius of the loop was approximately 1/2-inch. The 7/8 by 7/8-inch wooden strips to which the samples were fastened were mounted on panels. Two sets of samples were prepared.

One set of samples was exposed to the sun at Trenton, N. J., and the other set was sent to the Sub-tropical Testing Laboratories, at Miami, Fla. The samples sent to Florida were returned to us at the end of six months. The exposure tests were started March 22, 1937, and the six months period in Florida was for the spring and summer months of March 22 to September 22, 1937.

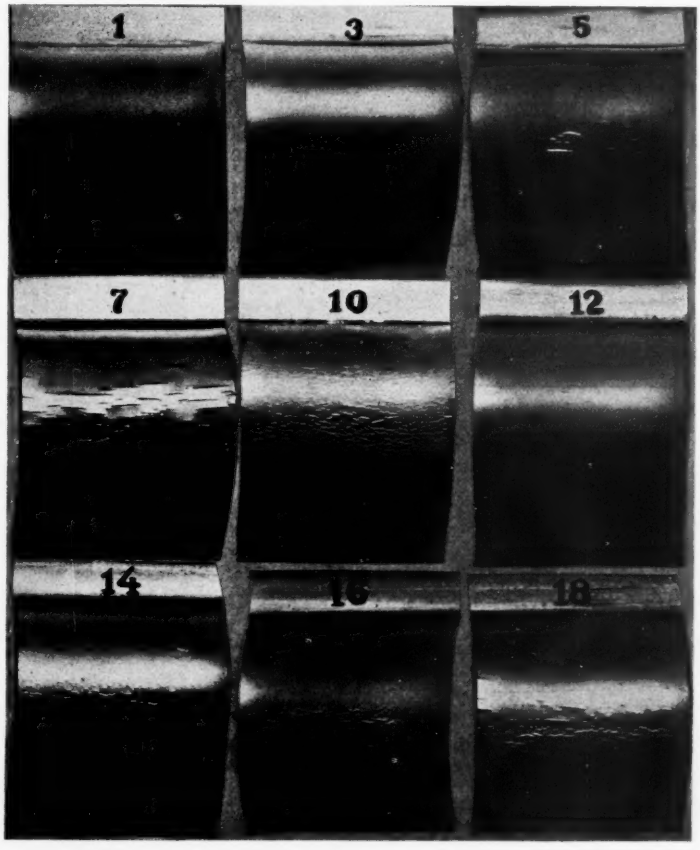
The samples aged in New Jersey were examined periodically, and the observations as noted at the end of the six-month period, March 22, 1937-September 22, 1937, and at the end of the 12-month period which extended to March 22, 1938, are given in Table 3. These samples are still under exposure, but further comparative observations have not yet been taken. Also given in this table are the observations as to condition of the samples aged for six months in Florida.

It is difficult to describe, in a table, the degree of checking that occurred in the various samples, and in noting the observations given in Table 3, we have designated "no checking" as OK. No attempt has been made to differentiate between the degree of checking that occurred in some of the samples; but wherever there was any evidence whatsoever, the sample was classified as "checking."

The accompanying illustration shows the condition of a few of the strips after a year's exposure to the sun in New Jersey.

Strip No.	Stock No.	Cure	"Thiokol"DX	Rubber
1	16	30/298°	100	75
3	17*	30/298°	100	100
5	18	30/298°	75	100
7	19	30/298°	50	100
10	36	30/298°	0	100
12	31	30/298°	100	75
14	32	30/298°	100	100
16	33	30/298°	75	100
18	34	30/298°	50	100

*Stock 17 checked in six months in Florida.



Conclusions

The point at which sun checking starts in both sets of blends is with mixtures of 100 parts of "Thiokol" DX to 100 parts of rubber. The addition of Sunproof does not permit the use of a higher amount of rubber on the "Thiokol" DX if complete sun checking is to be avoided. However it was noticed that the blends containing Sunproof, which did check, cracked less severely than did the corresponding blends containing no Sunproof. No apparent difference in the degree of checking resulted from the variation in time of cure.

Where a "Thiokol" DX-rubber stock does check, the cracks are fewer, but on the average much deeper and more severe than in the straight rubber stock. It seems from this work that unless sufficient "Thiokol" is used to insure complete freedom from checking the blend will be inferior to a straight rubber stock as regards sun resistance.

We believe that a good sun resisting

TABLE 3

Stock No.	Cure Mins./° F.	Ratio "Thiokol" DX	Ratio Rubber	6 Months Fla.	6 Months N. J.	12 Months N. J.
		Without Sunproof and AgeRite				
13	30/298	100	0	OK	OK	OK
	50/298			OK	OK	OK
15	30/298	100	50	OK	OK	OK
	50/298			OK	OK	OK
16	30/298	100	75	OK	OK	OK
	50/298			OK	OK	OK
17	30/298	100	100	Checks	OK	OK
	50/298			Checks	OK	OK
18	30/298	75	100	Checks	Checks	Checks
	50/298			Checks	Checks	Checks
12	20/287	0	100	Checks	Checks	Checks
	30/298			Checks	Checks	Checks
	50/298			Checks	Checks	Checks
		With Sunproof and AgeRite				
30	30/298	100	50	OK	OK	OK
	50/298			OK	OK	OK
31	30/298	100	75	OK	OK	OK
	50/298			OK	OK	OK
32	30/298	100	100	OK	Checks	Checks
	50/298			OK	Checks	Checks
33	30/298	75	100	Checks	Checks	Checks
	50/298			Checks	Checks	Checks
36	20/287	0	100	Checks	Checks	Checks
	30/298			Checks	Checks	Checks
	50/298			Checks	Checks	Checks

stock can be made from blends of "Thiokol" DX and rubber if the rubber is not used in amounts greater than 50 to 60 parts on 100 parts of "Thiokol" DX. While our data indicate that higher percentages of rubber in the stock might be perfectly stable in sunlight, we hesitate to recommend larger amounts at the present time.

Wire Insulating Process

(*Continued from page 37*)

porating a Western Electric patented spring diaphragm which is activated by air pressure. The diaphragm assembly consists of two rubber disks, centrally cone-shaped toward a small center hole and with radial slots to permit expansion, and a similarly shaped spring steel disk for reenforcement. These three disks are held in place against the inner tube orifice by a hollow plunger activated by air pressure.

The device for automatically feeding the strips of rubber to the extruder consists of an upper spiked roller and a lower plain roller and is activated through a lever arm by the height of the bank of excess stock in the hopper. The cooling tank, shown as No. 17 in photographs D and F, contains two power-driven tandem capstans with multiple grooves over which the covered wire passes several times, thus providing the necessary motive power to pull the wire through the system and sufficient longitudinal exposure to the cooling water. From nozzles above the capstans the cooling water is sprayed on to the traveling wire, and, when necessary, the water level can be raised above the bottom of the capstans, thereby immersing the bottom return portion of the wires in the loop.

Although the entire installation of two separate and complete units is approximately 175 feet long, the actual operating floor space required is about 50 feet by 15 feet for the inspection, cooling, dusting, and winding on reels. After vulcanization the covered wire is led down and in a reverse direction so that the finishing equipment is located on the floor under the suspended vulcanizing tubes. The extruders, V-belt driven motors, and wire supply stands are located on a mezzanine floor, and the vulcanizing chambers are suspended from the ceiling. Some additional space is needed for the steam compressor, motor relays, etc., but these need not be located near the insulating unit.

Mechanicals Exports Up

United States mechanical rubber goods exports advanced in June. Compared with May, June exports of total rubber manufactures, value $2,015,467, were 6.7% less in value; those of mechanical belting, other than auto, weighing 228,530 pounds, value $118,932, increased 22.9% in volume and 22.3% in value; those of garden hose increased 16.4% in volume and 29.9% in value; other hose and tubing, weighing 411,604 pounds, value $159,426 increased 40.4% in volume and 37.9% in value.

Comparing the first six months of 1938 with the same period last year, 1938 exports of rubber manufactures, value $13,051,667, were 17.9% less.

Declining from a value of $1,164,373 for the first half of 1937 to $595,571 for the first half of 1938, U. S. imports of rubber manufactures dropped 49.8% in value. *Commerce Reports.*

Processing Characteristics of Rubber Compounds[1]

Effect of Pigment Particle Size and Surface

A. H. Nellen[2] and C. E. Barnett[3]

A STUDY of the processing properties imparted by any pigment to a rubber compound is important in determining the most effective and economical type of pigment for a particular purpose. For example, in a truck tire carcass compound where zinc oxide may be the main pigment, in order to obtain the maximum quality this zinc oxide should be of the type which will give a soft uncured stock and free-flowing qualities so that the cords in the carcass may be thoroughly impregnated during the calendering and curing processes. Also, in a tread compound where channel black is the main pigment, that type of black which will allow faster incorporation into the rubber, faster extrusion, and better flowing qualities will result in manufacturing economies. In the case of both the zinc oxides and the carbon blacks it is essential that these desirable processing characteristics be obtained without losses in other properties, such as rate of cure, tensile strength, and abrasion resistance.

Nellen[4] recently described a tubing machine plastometer for the determination of the working qualities of rubber; Gamble and Barnett[5] discussed a method of measuring the relative particle size and size distribution of pigments, based on their scattering characteristics in the visible and near infrared portions of the spectrum. The work discussed in this report was undertaken to determine, by application of the methods described in these papers[4, 5], the relative importance of the particle size of pigments and the nature of the surface, in controlling the factory processing of pigments in rubber.

Tubing Machine

In the operation of the tubing machine the rubber is cut into small pieces and fed into the hopper; after exactly 200 grams have been run through to bring the rubber in the machine and the die to a constant temperature, three one-minute samples are cut off by means of a cutter fastened in front of the die. During the extrusion of these samples the temperature of the extruding rubber, power readings, and circulating water temperatures are noted. The three samples are weighed individually and their average recorded as grams extruded per minute (G_x in the tables). The loaded machine is held for three minutes; then by means of pressure applied to the diaphragm, the die is forced back against the rubber in the machine, and the time required to extrude 5.4 cc. of compound is recorded as M. The factor G_x is a direct measure of the tubing speed; M is an inverse measure of plastic flow; and the relation G_x/M combines the two as a measure of the plasticity of the stock. Further details of the machine and its operation are given in the original article.[4]

Particle Size of Pigments

The particle size examination is carried out on the same compounds that are prepared for the measurement of the rubber properties. These compounds are made into suspensions of known constant concentration with carbon tetrachloride, and the percentage of light transmitted by the pigmented suspension is measured from the visible blue to a wave length of about 4.0 microns in the infrared in comparison with an equivalent suspension of unpigmented rubber. The size and size distribution characteristics of the pigment are related to the shape of this curve by the following considerations. Low transmission in the short wave-length region is indicative of small particle size, and the greater the selectivity (slope of the transmission curve toward longer wave lengths) accompanying the low transmission, the finer is the particle size. High transmission in the short wave-length region without selectivity is indicative of coarse particle size. Low transmission in the long wave-length region is also indicative of a large particle size. The average particle size of the pigment is roughly indicated by the point in the spectral transmission curve at which selectivity begins to develop. This occurs at a point where the particle size approaches the magnitude of the wave length. A more detailed account of the method is given in the original article.[5]

Table 1 shows the measurements obtained on the tubing machine for a series of 61-39 zinc oxide-smoked sheet master batches. The master batches were prepared on a laboratory mill, using a milling procedure which had been checked for reproducibility in the plasticity test. In three checks on the milling procedure, values for G_x were obtained of 16.64, 16.75, and 16.74. Zinc oxides A, B, C, and D are of the fast-curing variety and were prepared to cover a wide range of size characteristics; E, F, G, and H represent a similar series in the slow-curing type. From the method of manufacture it would be expected that the first four zinc oxides would have similar surface characteristics and also the last four, but that there might be considerable difference between the two series. The particle size characteristics of these zinc oxide samples are shown by the transmission curves of Figure 1. Pigments A, B, and E give curves of low transmission in the short wave-length region, and high selectivity and high transmission in the longer wave lengths; all properties indicate fine particle size and a high degree of uniformity of par-

[1] Presented before the Rubber Division, A.C.S., in Detroit, Mich., Mar. 28. Reprinted from *Ind. Eng. Chem., July*, 1938, pp. 776-78.
[2] Lee Tire & Rubber Co., Conshohocken, Pa.
[3] New Jersey Zinc Co., Palmerton, Pa.
[4] Nellen, *Ind. Eng. Chem.*, 29, 886 (1937).
[5] Gamble and Barnett, *Ind. Eng. Chem., Anal. Ed.*, 9, 310 (1937).

ticle size distribution. From the position of the selective portion of these curves with reference to the wave-length scale, A is shown to be finer than either B or E, and E very slightly finer than B. Sample D is by far the coarsest oxide in the series, as indicated by high transmission in the short wave-length region, relatively low transmission at the long wave lengths, and an almost complete lack of selectivity. Zinc oxides F, C, G, and H fall in between these extremes and in that order of increasing particle size and decreasing uniformity of particle size distribution. From the previous discussion it is seen how this conclusion follows from the transmission curves. The data in Table 1 show that within each series the tubing speed increases, while M decreases and G_x/M increases with increasing particle size of the zinc oxide. The relative order of the oxides with respect to particle size and tubing speed is also given in Table 1, and the agreement between the two properties is very good, even when both the slow- and fast-curing types are included in the comparison. The plasticity of the entire series of samples does not show as good correlation with the size characteristics as does the tubing speed; yet all of the discrepancies occur with the four pigments of finest particle size. For example, although sample B is considerably finer than F, it produces a softer and more plastic stock. These data show clearly that the working properties of a pigmented rubber compound vary directly with the particle size characteristics if the condition of the surface is the same.

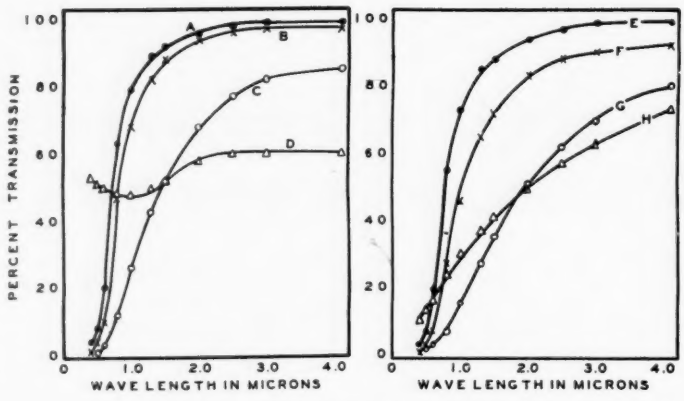


Fig. 1. Infrared Transmission Curves of Zinc Oxides

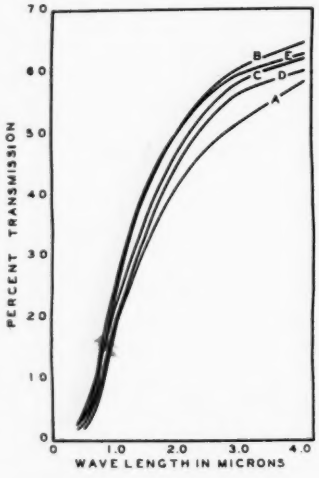


Fig. 2. Infrared Transmission Curves of Channel Blacks

TABLE 1. MEASUREMENTS FOR ZINC OXIDE-SMOKED SHEET MASTER BATCHES

Zinc Oxide	G_x	M	G_x/M	Relative Fineness	Relative Tubing Speed
A	51.45	2.15	23.9	1	8
B	65.64	1.17	33.2	3	5
C	83.15	1.14	73.0	5	4
D	99.93	0.71	140.7	8	1
E	57.38	2.65	21.6	2	7
F	64.24	2.63	24.4	4	6
G	87.56	0.75	116.8	6	3
H	88.67	0.73	121.5	7	2

Nature of the Surface

In order to obtain more information regarding the effect of variations in the nature of the surface, zinc oxides similar to B and C of Table 1 were treated in different ways in order to change their surface characteristics. Particle size measurements were made on all of the samples prepared to be certain that this property was constant throughout each series of pigments. The data are shown in Table 2. Compound 1 was formulated with the untreated zinc oxide with an average particle diameter of about 0.20-micron; 2 was the same with the addition of a fatty acid equivalent to 0.3% of the weight of the zinc oxide during the milling of the compound; in 3 the same amount of fatty acid was added to the pigment as a surface coating, and the treated pigment was milled into the rubber; the pigment used in Compound 4 was exposed to sulphur trioxide vapor until the acidity, by titration with 0.01 N sodium hydroxide, measured 0.23%. Compounds 5, 6, 7, and 8 corresponded to 1, 2, 3, and 4, respectively, except that the base pigment had an average diameter of about 0.40-micron. The pigment-rubber ratio was the same as in the compounds of Table 1. The data in Table 2 show that the changes made in the character of the surface of the finer zinc oxide produce nearly as much variation in the working properties as did the extreme variations in particle size shown in Table 1. In the case of the coarser zinc oxide the differences in tubing rate caused by alteration of the surface of the pigment were slight, although the plasticity was increased considerably in the case of the pigment which had been surface-coated with fatty acid. This result undoubtedly explains the behavior of the pigments in Table 1. Surface effects seem to be of great importance in the case of the finer pigments; when the particles are above a certain diameter, good working properties are obtained regardless of the nature of their surface. The sulphur trioxide treatment of the finer pigment decreases the tubing rate and the plasticity in comparison with the untreated pigment; in the case of the coarser zinc oxide this exposure to sulphur trioxide was without effect on the working properties. The use of a pigment which had been surface-coated with fatty acid prior to incorporation had a much greater effect on the working properties than the addition of the same amount of fatty acid to the compound during milling. Surface treatment of the finer pigment with fatty acid resulted in a marked increase in the tubing rate and softness of the master batch. With the coarser oxide the resulting increase in the tubing rate of the rubber batch was slight, but the increase in plasticity was obtained.

TABLE 2. EFFECT OF VARIATIONS IN THE NATURE OF THE SURFACE

Compound	G_x	M	G_xM	Compound	G_x	M	G_xM
1	59.08	1.54	38.4	5	83.71	0.95	88.2
2	64.57	1.35	47.9	6	96.56	0.66	146.5
3	82.36	0.71	116.0	7	99.56	0.53	188.5
4	52.23	2.19	23.8	8	83.47	0.96	86.9

In the course of this investigation experiments were made with samples of carbon black, precipitated whiting, ground limestone rock, and clay; while it was not possible to control the size and surface properties as was done with the zinc oxides, the general conclusions are the same. The processing properties improve as the particle size of

(*Continued on page* 49)

Ideas from Management Congress

THE views of the world's industrial leaders which were propounded at the Seventh International Management Congress in Washington, D. C., during September gave evidence of the marked change in management ideas in recent years and the widely divergent means employed for obtaining similar objectives in different countries. Keynote of the conference was the apparent recognition by those present of the increasing social obligations of management.

William L. Batt, president of SKF Industries, Inc., and newly elected president of the International Committee of Scientific Management, summed up his conception of management's responsibilities in the term "business citizenship" and declared "Whenever capital and labor are willing to take the long look together unselfishly, they are not likely to find themselves far apart. Capital wants security and return. And labor wants security and return. That is fair enough."

Lewis H. Brown, president of Johns-Manville Corp., pointed out that the public's lack of knowledge of the acceptance by industrial leaders of their social responsibilities was one of the more serious handicaps under which industry operates today and presented the creed of management reproduced on this page.

Factors of "nationalism" and "territorial sovereignty" must give way to an international point of view in economic affairs if the economic problems now confronting the respective countries of the world are to be solved in the best interests of all, the Right Honorable Viscount Leverhulme, president of the International Committee of Scientific Management, declared before the congress. Ralph E. Flanders, president, Jones & Lamson Machine Co., expressed the view that national planning was comparatively easy in a nation with a low standard of living, but both impossible and unnecessary in a country where there was an economy of abundance. According to Dr. A. Basch, general manager of the United Chemical & Metallurgical Works of Prague, Czechoslovakia, government social policy, by stressing redistribution of income rather than the need of increased production, is today preventing attainment of its own chief objective—a higher standard of living—and actually is causing a lowering of living standards. Speaking for Germany, Dr. George Seebauer, president of the German Board of Efficiency, declared that, to some extent, to make reference to a free economy today is a matter of wishful thinking and held that government interference has been a standard device since 1915, the general rule being toward controlled economy throughout the world. Jean Milhaud, of the Industrial Organization Service of France, in describing measures being taken in his own country, pointed out that two hundred industrial codes which have been agreed to by workers, employers, and consumers have been adopted without the direct intervention of government and that control is at a distance if it exists at all. Great Britain's fundamental philosophy of employer-employe relations is founded on the belief that "self-discipline in industry through voluntary trial and error is a greater national asset in the long run than is rectitude imposed by decree," R. Lloyd Roberts, of London, chief labor officer of Imperial Chemical Industries, Ltd., declared.

Asserting that "the middle class" is the real owner of American industry, William Allen White, editor of the *Emporia (Kansas) Gazette,* told the congress that neither capital nor labor could thrive and prosper in this country without its support. Robert J. Watt, American Worker's Delegate to the International Labor Office, told the congress that American labor wants to be recognized as "the partner of capital in production, as the customer of capital in dis-

The Creed of Management

"WE WHO are responsible for the management of industry in supplying the needs of the public for goods and services and who recognize our obligations to stockholders and employes, believe,

"That we should constantly seek to provide better values at lower costs so that more of our people can enjoy more of the world's goods.

"That we should strive to develop the efficiency of industry so as to earn a fair return for the investing public and provide the highest possible reward for the productivity of labor.

"That we should stimulate the genius of science and utilize the methods of research to improve old products and create new ones so as to continuously provide new fields of employment for the present and the coming generations.

"That management should encourage fair trade practices in business which, whether effected by competition or cooperation, will be so shaped as to be for the best interest of our customers and of society as a whole.

"That it is management's duty to be alert to its own shortcomings, to the need for improvement, and to new requirements of society, while always recognizing the responsibility of its trusteeship.

"That business in this country has never been what it could be and never what it yet will be.

"That Business, Labor, Government and Agriculture working hand in hand can provide jobs and the opportunity for all to work for security without loss of our liberty and rights as free men.

"That is my suggestion of a common meeting ground not only for management and labor, but for all of us."

tribution, as the majority voice in a political democracy, and as the substantial center of our community life." Prof. J. Douglas Brown, of Princeton University, declared that it is of the greatest importance that American industry develop a wage policy that will give the laborer security, not only through the entire year, but through the wide variations of the business cycle.

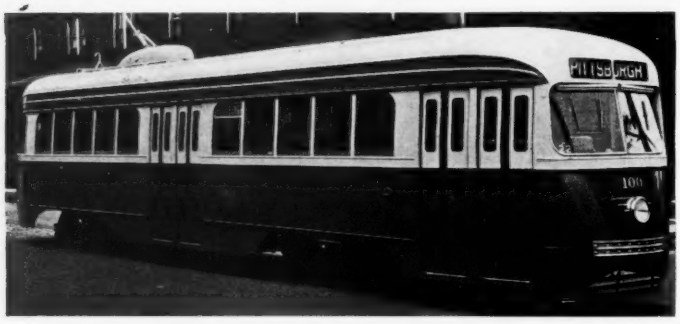
Attributing man's achievement in every age to the tools at his disposal, Dr. Karl T. Compton, president of Massachusetts Institute of Technology, pointed out that the mechanical power now used in the United States was equivalent to 50 slaves working for every citizen and expressed the belief that technology could be counted on to function as a force toward the solution of current social problems. Prof. John R. Bangs, Jr., of Cornell University, pointed out that American industry is spending $200,000,000 yearly on research and is maintaining some 35,000 trained scientists in about 1,600 laboratories.

Conflict between the ups and downs in the public's demand for goods and the quantity of goods a factory is equipped to make was termed the principal problem of management today by Nils A. Sterner, assistant general manager of the L. M. Ericsson Telephone Co., Stockholm, Sweden.

In Mr. Sterner's words, "Distribution, under the influence of changing consumer demand, is dynamic, while production, in consequence of the capital expended in preparation work and in equipment, is static."

Henry G. Weaver, director of the customer research staff of General Motors Corp., held that automobile sales could be increased by 5,000,000 a year by spreading the population of our large cities over a wide area.

Rubber in the Modern Street Car[1]



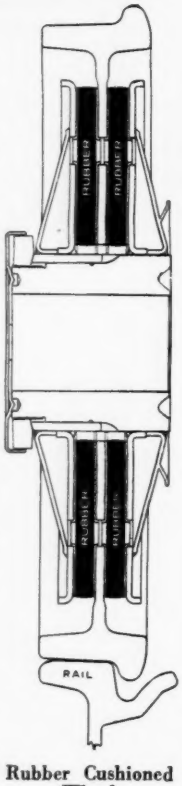
P.C.C. Designed Car

ABOUT 1930 The American Transit Association appointed what was known as the Electric Railway Presidents' Conference Committee and gave it the job of developing a modern street car which could keep pace with present-day traffic on city streets. Five years were spent in development and research, and the first cars were introduced to the public by the Brooklyn & Queens Transit Corp. in the Fall of 1936.

The P.C.C. cars were designed especially for speed, quietness, and comfort. They can move away from a traffic light as fast as the average automobile.

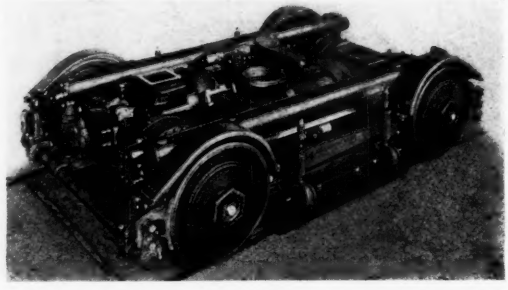
Quietness and comfort are secured through the embodiment of approximately 400 pounds of rubber in the construction of each car. Steel springs have been replaced with four-stage shear-type rubber springs. The old-fashioned solid steel wheel gives way to resilient wheels in which the steel tire running on the track is supported in shear by large sandwiches of live rubber. Other parts of the truck, such as brake tube supports, etc., have been insulated with rubber to eliminate rattles and noise.

Speed was obtained by the use of specially designed motors and controls which make possible high acceleration without causing any discomfort to the passengers.

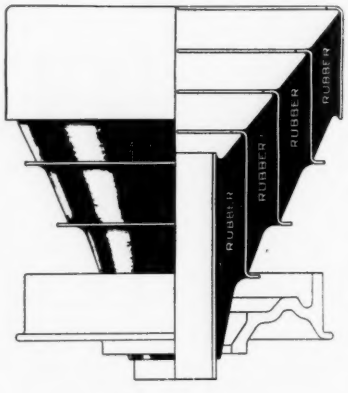


Rubber Cushioned Wheel

Approximately 800 P.C.C. cars are now in service in Brooklyn, Chicago, Baltimore, Pittsburgh, Washington, Los Angeles, San Diego, Philadelphia, and Toronto. The patrons in these cities have been very enthusiastic about them and operating companies report a material increase in the revenue therefrom.



P.C.C. Truck with Rubber Cushioned Wheel



Cutaway View of Four-Stage Shear-Type Spring

A streamlined, three-car train with articulated trucks is now under construction for the New York Rapid Transit Co. This train will be equipped with the same type of truck as is used on the P.C.C. cars and with a new-type super-resilent wheel. Trial runs will be made both on the elevated and in the subway, after which the train will operate in regular service.

[1] Photographs by courtesy of B. F. Goodrich Co., Akron, O.

Prevention of Air in Compounded Latices[1]

Henri Leduc

IT IS known that latex baths, and especially those intended for the manufacture of dipped goods, have a tendency to retain air bubbles easily. One reason for this phenomenon is the rapidity with which these baths, when in contact with air, are covered with a firm rubber skin which imprisons the air bubbles beneath and prevents them from coming to the surface of the vat and bursting.

To prevent the formation of this surface skin the parts exposed to the air can be changed as frequently as possible, by constant stirring. Otherwise it is necessary to skim the surface of the bath before each dipping, for if this precaution were neglected, the more or less coagulated skin would be torn by the mold, partly adhering to it, and thus lead to unevennesses in the thickness of the article.

Unfortunately each time this skin is removed, the risk is run of again introducing air bubbles into the mix, while the skin has no value and represents a dead loss. If, on the other hand, the bath is maintained in a state of permanent agitation, the air bubbles accidentally introduced into the latex are continually dispersed in it and, when they are removed by the mold, form weak spots in the finished articles.

Effect of Skin Formation

Now it is possible to prepare latex baths containing sulphur, fillers, zinc oxide, and accelerator in such a way that the baths may be kept at rest in open vessels for a long time without any skin forming on the surface. It is even possible to prepare baths in which, after a period of rest, the useful material is separated from the atmospheric air by a film of water several mms. thick. Under these conditions, of course, the air bubbles which come to the surface can freely burst so that at the end of 24 or 48 hours the preparation is perfectly free of bubbles.

I have been able to keep a preparation of this kind in an open vessel for six months without taking any other precaution than that of periodically replacing the evaporated water with ammoniacal water.

At the end of this period there was practically no sedimentation of fillers. These baths are very stable; they resist friction very well, and they may be used with spray guns, for instance. Very slight agitation, by means of a screw immersed in the vat, provides perfect homogeneity in the bath within a few minutes.

A final advantage of this preparation is that if for any reason bubbles are present in the vat, either resulting from preparation of the mix or accidentally introduced in the course of manipulation or operation in dipping, and if a mold on leaving the bath takes a bubble along, the latter will soon burst and the adjacent latex will close in to stop up the weakness. If not so treated, in the case of mixes which almost immediately form a surface skin on drying, the bubbles are imprisoned in the interior of the finished article forming weak spots.

Again, this absence of surface skin causes the article to dry very rapidly because the water of the latex is not separated from the atmosphere by an almost impermeable layer of rubber which obstructs its passage. Such a preparation passes almost without transition from the liquid or pasty to the solid (coagulated) state.

Also if, for instance, a layer of this preparation is spread on a sheet of glass so that the thickness decreases toward one end, drying, which naturally starts at the thin end, progresses step by step toward the thicker end; and when a pin is drawn through the product, the point passes through the liquid part without leaving any trace, then suddenly comes in contact with the coagulated part which it removes at one stroke, leaving nothing on the glass plate.

We know that with present preparations the pin would, over its entire passage, remove a surface film of coagulated rubber under which would remain an almost untouched liquid.

Theory of Action

Because of lack of time I have not up to the present been able to establish the exact mechanism of this phenomenon which is evidently a special flocculation. However it seems that the particles of rubber in the latex are absorbed by the different fillers, which explains this kind of heaping up of the contents of the bath under a layer of water, because the grains composed, for instance, of a particle of zinc oxide or of sulphur, coated with rubber particles, have at this moment a density that is between that of rubber and that of the fillers, an average density which may easily be a little less than that of water. As a result, there is an apparent increase in the density of the rubber and at the same time a decrease in that of the fillers. In short, a kind of varnishing with rubber would be obtained on the surface of the pigments. I must add that I think this is merely an approximate explanation and that in reality the phenomenon must be more complex.

Preparation of Bath

However this may be, the method of preparing such bath is well established, and below I am giving one of the methods which seems to us most suitable. The proportions of the materials are for an amount of 58 to 60% concentrated ammoniated latex equivalent to 10 kilograms of dry material.

First a casein solution like that below is prepared:

A	Hot water	500 grams
	Lactic casein	150 grams
	Ammonia at 22° B.	50 grams

Following the usual procedure, the casein is first allowed to swell in the hot water for 20 to 30 minutes;

[1] Translated from *Rev. gén. caoutchouc*, May, 1938, pp. 127-28. Paper awarded the annual prize of the Syndicat du Caoutchouc for 1937.

then the ammonia is added, and the whole is kept in a bain-marie in a covered receptacle.

Meanwhile the fillers:

B	Sulphur	200 grams
	ZnO	300 grams
	Titanium	300 grams
	China clay	500-2,000 grams or more
	Accelerator	as desired
	Colors	as desired

are placed in a mortar.

If a rather thick bath is desired, a few grams of gum tragacanth may be added. The powders are slightly mixed, and over them enough hot water is poured to form a fairly thick paste. The powders are allowed to soak; then about half of the casein solution is added. The mixture is then passed through a color mill several times so as to obtain good dispersion of the whole.

In another vessel the following are mixed:

C	Castor oil	100 grams
	Oleic acid	50 grams
	Paraffin	as desired

and are poured into the rest of the casein water, while being stirred to insure dispersion.

This emulsion is added to the paste coming from the color mill, and the whole is again passed through the mill once or twice. Now the *latex is added to the paste,* first in small quantities, as oil is added to a mayonnaise, then more rapidly when the whole has become sufficiently fluid. The mixture is stable enough to be passed through a color mill once, and the preparation is ended. After resting one or two days, the preparation is then ready for use.

Notable Phenomena

The proportions of the powders do not appear to have any great effect on the final result of the preparation, but the relative proportions of fatty acids (added at the end) as compared with the amount of ammonia in the mix are important.

The greater the quantity of fatty acids, the more marked the phenomenon will be; that is, by manipulating the relative proportions it is possible to obtain ordinary mixes drying with a skin, mixes drying without skin and having no tendency to sedimentation, and mixes like those discussed in preceding paragraphs in which the latex heaps up under a layer of water.

I must point out that when these preparations are intended for the manufacture of dipped goods, it is advisable not to have the proportion of fatty acids too high and to keep just at the limit at which the superficial skin disappears from the baths, because exaggeration toward the side of sedimentation may cause the product to crack when drying.

The proportions which have been given are not absolute; they depend in a measure upon the source of the powders used, the accelerator, as well as the pH of the casein employed and the alkali content of the latex.

A similar phenomenon could be brought about by adding to the dispersion (casein plus fillers) a colloid product chosen to fix, by absorption, a considerable quantity of the ammonia which holds the casein in solution and thus replacing the oleic and castor oil mixture.

Again, a boric acid solution could be added or a weak or suitably diluted acid. If the casein is in solution in borate of sodium, the phenomenon can also be produced. In the case of a borated casein flocculation can be induced by the addition of a suitable quantity of Barak.

Finally, and this is the most curious point, if two compounded latices are mixed, of which each taken separately does not manifest the phenomenon of which we are speaking, it is possible, by a judicious choice of the pH of each of the two products and of their relative proportions, to obtain a mix which in a few hours displays the properties mentioned.

A final interesting phenomenon is this: if a B-type latex is diluted with water and is spread in layers of two or three mm. on a horizontal glass surface, for instance, a special sedimentation occurs during drying, and the dry product adheres in an extraordinary fashion to its support. It seems that the casein and a part of the fillers are deposited on the glass insuring very strong bonding.

All these phenomena can be easily reproduced with Neoprene latex.

Inner Tubes for Preserving Posts

The United States Forest Service has evolved a method, using tire tubes, to preserve fence posts, said to be one of the simplest and cheapest treatments for preventing or retarding decay. This treatment is especially desirable where posts are made from trees growing on the farm. It may be applied while the post is fresh cut.

Such posts are placed on the ground with the butt ends raised and peeled for at least a foot. Then a section of close-fitting old inner tube is slipped over each peeled section and tied tight with several wraps of strong cord. The open ends of the tubes are clamped to a bar above the butts.

The preservative solution consists of zinc chloride dissolved in nine times its weight of water or about five pounds of the salt for a five-gallon mixing can. The solution, which is poured into the open ends of the tube and left until absorbed, usually in not more than 24 hours, displaces the sap of the fresh-cut posts.

U. S. Reclaimed Rubber Exports

United States exports of reclaimed rubber amounted to 7,208,183 pounds, value $402,947, in the first six months of 1938, compared with 12,909,278 pounds, value $583,606, in the same period of 1937, declines of 44.2% in quantity and 31% in value.

Foreign markets for reclaimed rubber are indicative of rubber manufacturing activity, usually in automobile tires, inasmuch as this product is used only in the production of new rubber articles. Leading export markets in the first six months were as follows: Canada, 3,626,056 pounds, $204,475; United Kingdom, 1,129,820, $64,971; Argentina, 813,710, $36,972; Australia, 806,850, $48,171; Union of South Africa, 408,157, $20,740; Ireland, 96,367, $5,795; British India, 90,036, $4,909; Cuba, 60,964, $5,578; Switzerland, 45,364, $1,848; and Sweden, 24,745, $1,417. Countries taking smaller quantities of reclaimed rubber from the United States in the period under discussion, in the order of their importance, are: Chile, Finland, France, Azores and Madeira Islands, Mexico, Greece, Netherland India, Venezuela, New Zealand, Uruguay, and Brazil. Puerto Rico, which is not classified as a foreign country, was the destination of 4,350 pounds of reclaimed rubber, value $55. Every country, except Cuba, in the first ten countries named as destinations of exports of reclaimed rubber, manufactures automobile tires and inner tubes. Cuba has a growing industry for canvas rubber-soled footwear.—*Commerce Reports.*

University Training in Rubber Technology[1]

Educational Facilities for Special Training in Rubber Chemistry and Technology in the United States

Howard I. Cramer[2]

THE development of any industry during the past 50 years has been dependent very largely upon the careful study of the chemistry involved in its processes, and the full recognition of the vital worth of the constant counsel of its chemists. This principle is well demonstrated in the growth of the rubber industry in the United States of America, where today we find employed an estimated 700 to 800 chemists in all types of positions, ranging from that of control chemist to that of president of one of the largest rubber corporations.

Pioneer Rubber Chemists

In the early days of the industry, from the time of Charles Goodyear until about 1900, the services of the chemist were considered unnecessary in the scheme of the ordinary rubber factory. What would have been his functions were taken care of by the factory superintendent, who, according to Dr. W. C. Geer, "served as inventor, power engineer, labor chief, production driver, cost estimator, price-fixer, first-aid doctor, and sometimes as a salesman and promoter."[3] The annals of this period, when rule-of-thumb production methods held the stage, show few epochal technical advances. In 1895 the value of the products of the whole industry in the United States was approximately $75,000,000. In about that year Arthur Marks, a Harvard graduate, began his work on the alkali process for the reclaiming of vulcanized soft rubber. This process was first put into production in Akron, O., in 1899-1900. Marks, a chemist himself, and probably the first man in the rubber industry to realize the value to it of chemical research, hired George Oenslager in 1905 to begin the work which led to the discovery of organic accelerators for the vulcanization of rubber. These two men, with a few others like C. O. Weber and David Spence, constituted the group which at that time could be classed as "rubber chemists." From this time forward the importance of the chemist to the industry was established, and the number of the profession found therein increased steadily until it now has reached the figure cited above. During the same period the production of the whole industry increased to the point where its annual sales averaged one billion dollars during the decade 1920-30.

Dr. Charles M. Knight

First Course in Rubber Chemistry

From the beginning of the industry the art of manufacture and the knowledge of technical advances were held in deep secrecy. This was true even at the time of Oenslager's discovery of vulcanization accelerators, the disclosure of which was withheld from even the technical men in the industry in Akron until 1910-12. This tendency created the need of some central institution free from all industrial connection to provide special training for chemists in the science of rubber technology, as it was then known. This need was recognized by Dr. Charles M. Knight, professor of chemistry at Buchtel College.

Dr. Knight, a graduate of Tufts College, Mass., had come to Akron in 1875 as professor of science at the recently founded Universalist school, Buchtel College. He had, therefore, been able to observe at first hand the development of the rubber industry in Akron, which by the beginning of the twentieth century was well on its way to becoming the rubber center of the United States. He had been in close touch with the technical advances within the local factories, having done, as stated in his biography by a former student, "chemical work for the Goodrich Company years before the managements of many rubber companies realized that a chemist is a necessity rather than an expensive luxury." This contact convinced him that the department of chemistry should be training young men to meet the need of technical men in the new industry and resulted in his conceiving and planning the course in rubber chemistry, which was inaugurated in the Fall of 1909. He continued to teach the course until he retired from teaching in 1913 as professor emeritus of chemistry.

University of Akron

The new course in rubber chemistry was taken over in 1913 by H. E. Simmons, who became head of the department in that year. It was during this year also that Buchtel College became the University of Akron, a municipal institution. Professor Simmons was a former student of Dr. Knight's, having graduated in 1908 and continued

[1] Reprinted from *Akron Alumnus*, June, 1938.
[2] Department of Chemistry, University of Akron, Akron, O.
[3] "Rubber," H. and R. Wolf, Covici Friede, New York, 1937.

his studies at the University of Pennsylvania, where he had obtained the Master of Science degree. He had been closely associated in the early work of the course with Dr. Knight and had been a member of the department since 1910.

The course was developed by him to keep pace with the rapidly growing rubber industry. The content of the lectures was expanded from year to year to include the recent advances in the chemistry and technology of rubber. The laboratory was equipped with many modern rubber testing machines, making possible a very complete laboratory study of the subject. Professor Simmons continued to direct the work until he was appointed president of the university in 1933. For the 20 years that he was in charge of the course, it was the only college training course in rubber chemistry in the United States, and as such it won an international reputation.

Prof. H. E. Simmons

In addition to contributing thus to the development of the profession, Dr. Knight and Professor Simmons played a vital part in the organization and successful functioning of the Rubber Division of the American Chemical Society. The formation of this body was first proposed just prior to the World War by Dr. Knight, who served as its first chairman. Professor Simmons was active in its formation and served it as secretary-treasurer from 1927 to 1934. In recognition of his contributions to American chemistry, the College of Wooster, Wooster, O., conferred the degree of Doctor of Science upon President Simmons in 1934.

The course in rubber chemistry and technology at the University of Akron comprises lecture and laboratory work, each carrying two credit hours per semester, or a total of eight credits for the year's work. The lectures are also given on alternate years in the Evening College. A new course dealing with the chemistry of latex technology was offered for the first time this year.

Akron's Course in Rubber Chemistry

The course in rubber chemistry is open to seniors or fourth-year students and to graduate students and requires as a foundation a thorough knowledge of inorganic analytical and organic chemistry. The lectures present theoretical and practical discussions of such fundamental divisions of rubber chemistry and technology as the early history of rubber, rubber producing plants and their geographical distribution, latex and crude rubber, plantation practice, elements of compounding, vulcanization, use of accelerators and antioxidants, plastication and softeners, synthetic and substitute rubbers, reclaiming, applications of latex, the production of the recently commercially important derivatives and so-called isomers, chemical analysis, and physical testing methods. More theoretical topics, such as the chemistry and the structure of the rubber hydrocarbon, the mechanism of accelerator and antioxidant action, and filler reenforcement, are also studied.

In the accompanying laboratory work the student first studies the analytical methods used in the examination of rubber goods. He then proceeds to compound the stock from analysis, to mill and vulcanize it, and to carry out the various physical tests to which the stock may be subjected. This experience enables the student to acquaint himself with the use of the various testing machines and to interpret the results of his tests. He has the opportunity at the same time, because of the variation in stocks studied and in accelerators, age resisters, softeners, and fillers used, to gain first-hand knowledge of the utility of many compounding ingredients. The compounding and curing of latex mixes are given some attention. Experimental work of a more definitely chemical nature is also included, such as the synthesis of accelerators and rubber derivatives.

Numerous plant inspection trips through the many rubber factories of the district are arranged for the class each year. These trips are so planned that the student may observe production methods and practices involved in the manufacture of as many widely different types of rubber goods as possible.

Facilities are available to graduate students to engage in research in the chemistry of rubber and accessory materials. Two fellowships are offered each year, one by the Firestone Tire & Rubber Co., and one by the Goodyear Tire & Rubber Co., to graduates of standard American colleges to engage in this study. These fellowships carry stipends of $1,000 with remission of all university fees. The requirements for the Master of Science degree may be completed during the tenure of the appointment. The recipients assist part-time in teaching in the department of chemistry.

The training offered at Akron has attracted students from all over the United States and from many foreign countries. The foreign students have numbered twenty, eleven from the Orient, two from South America, two from Scandinavia, two from Germany, and one each from the Philippines, Czechoslovakia, and Turkey.

Massachusetts Institute of Technology

The Massachusetts Institute of Technology, Cambridge, Mass., has for many years offered the opportunity for special thesis study in the chemistry of rubber. As early as 1891, E. A. Hersam of that school completed an investigation entitled, "Examination of the Rubber of the Milk-weed." From that time until the present approximately seventy senior or graduate theses have dealt with some phase of rubber chemistry. The major portion of the work has been done in the Department of Chemical Engineering, and in the later years under the direction of Prof. Warren K. Lewis. The work at the Massachusetts Institute of Technology in the broad field of rubber has been greatly extended and intensified in recent years with the addition of Dr. Ernst A. Hauser to the teaching staff as associate professor of chemical engineering. While Dr. Hauser's courses are formally listed under the heading "Colloid Chemistry," because of his broad experience in the rubber industry in Europe and in latex work in the Far East, much material is presented bearing on latex and rubber technology. The course work by Dr. Hauser has been given not only during the regular school term, but also in a special summer program in colloid chemistry. The summer work was offered in 1936 and 1937,[4] with approximately 35 students attending each year, drawn primarily from the laboratories of the rubber, leather, paint, paper, soap, and textile industries. Each year much of the accompanying seminar has been devoted to latex and rubber. In addition much fundamental research of a strictly rubber nature is being carried on by Dr. Hauser's graduate students as a part of the rather extensive program of the institute to investigate problems which are of interest to industry.

[4] Editor's Note. This course was also offered in 1938.

Other Institutions

Since 1934 the University of Southern California at Los Angeles, Calif., has been offering in its Evening Division a series of twelve lectures on rubber technology given by R. B. Stringfield. The lectures deal with the production, properties, and general industrial utilization of rubber, with special attention to milling, practical compounding, and chemical and physical testing. No laboratory work is given at the present time. Mr. Stringfield is well qualified to present this course, having been connected with the rubber industry since 1920.

The most recent course in rubber chemistry is that inaugurated by the Millard Fillmore College of the University of Buffalo, Buffalo, N. Y. This course, like that at the University of Southern California, is being given in the Evening Division. The work is under the direction of Dr. Howard W. Post, with the assistance of John Plumb, Jr., of the United States Rubber Reclaiming Co.; Dr. Wm. H. Sheridan, Dunlop Tire & Rubber Co.; and Michael Berman, Hewitt Rubber Co.

The influence of the graduates of these various courses of training in rubber chemistry on the development of the rubber industry in the United States has been marked. The course at the University of Akron has graduated, since its inception, about 150 students of whom approximately 115 are actively engaged in the industry. In addition there has been an estimated 50 special students who attended the school primarily for the rubber training. Of the entire group many have become chief chemists or production managers, and several have risen to high official positions within their companies. Many of the foreign students hold key positions in the industry in their respective countries.

The increase in the number of courses offered in rubber chemistry throughout the country during recent years reflects the increased interest in this particular branch of chemistry and the growing recognition by industry of the value of pre-industrial training in this field. This trend will undoubtedly be intensified by the general policy of the industry toward decentralization.

Processing Characteristics

(*Continued from page 42*)

the pigment increases if the surfaces are similar; if the pigments are coarse enough, the nature of the surface will be of minor importance in determining the processing quality, but the finer materials such as certain precipitated whitings are highly sensitive to changes in the surface. In this connection some of the results obtained with channel-process carbon blacks may be found to be of interest.

Five different carbon blacks were selected, representing a wide range of working properties of this pigment. The samples were milled into the rubber with 55 parts of pigment to 100 parts of rubber and 4% of softener; check batches were prepared with each pigment. The following results are the average values obtained for each pigment on the tubing machine and demonstrate that considerable variation exists in the working properties of these carbon blacks:

Carbon Black	*Gx*	Carbon Black	*Gx*
514	10.41	711	23.71
522	16.71	774	20.08
		775	18.00

Infrared transmission curves were also measured for suspensions of each of the compounds and are shown in Figure 2. So far as it is possible to determine by this method, no significant differences in particle size are indicated in this series of pigments. The application of the infrared transmission method in the determination of the size characteristics of carbon blacks was discussed in the previous paper.[5] The average diameter of carbon blacks 514 and 775 was also measured by counting the number of particles in a Nujol suspension of the compounds, using the ultramicroscope according to the procedure of Gehman and Morris.[6] The values obtained were within the experimental error of the method. These data indicate that the difference in tubing characteristics of these blacks results from differences in the nature of their surfaces rather than from differences in particle size.

[6] Gehman and Morris, *Ibid.*, 4, 157 (1932).

Uses of Glycerine

THE following material, taken from *Glycerine Facts,* form part of the data issued at intervals by the Glycerine Producers' Association on the latest uses of glycerine as a constituent of new products or processes of general industrial and manufacturing interest.

To Transfer Designs

For various uses it is frequently desired to transfer a design, print, or drawing to paper, cloth, wood, or other surfaces. This can readily be done by employing the following simple solution of familiar ingredients:

Glycerine	1½
Soap	4
Alcohol	10
Water	10

With this liquid, wet thoroughly the print or drawing to be transferred. Remove any excess of liquid with blotting paper, and invert print on the paper, cloth, or other surface to which it is to be transferred. Lay a piece of paper over this and rub with a blunt article such as a knife handle.

Suction Cups That "Stay Put"

Where suction cups are used to attach articles to tile, wall, or glass, frequent annoyance is caused by the cup giving way when air leaks into it and destroys the vacuum. The usual remedy of moistening the rim of the suction cup is effective only temporarily, for as soon as the moisture evaporates, the seal is broken, and air again enters. If instead of water, however, a little glycerine is used to rim the cup, it will be found that a tight strong seal will persist for as long as it is desired to hold the suction cup in place. The glycerine not only does not evaporate, as does the water, but also through its unique hygroscopic properties acts to attract more moisture, thus further insuring a perfect seal. In addition the glycerine is beneficial to the rubber of the cup since it prolongs its usefulness by preventing drying and cracking, a function of glycerine which gives it wide application in the rubber industry.

Editorials

Extension of Rubber Usage

THE ability of rubber to perform previously unrecognized functions is rapidly becoming known, but more promising is the fact that there is apparent an increasing desire on the part of potential users to learn more about the characteristics of various types of compounded rubber and the possibilities of adapting it to their needs. At the recent symposium on rubber, sponsored by the Rubber and Plastics Subdivision of the American Society of Mechanical Engineers, there was evidence of the need of the rubber industry to disseminate factual information to those in other industries who are not familiar with rubber, but who are concerned with finding and using materials which will satisfy their needs.

Very often through ignorance of the facts erroneous prejudices are created in the minds of those who otherwise should become consumers of rubber. The general public thinks of rubber as a finished article and is unaware that an almost limitless number of combinations can be obtained through compounding technique, each displaying a different set of characteristics.

Although a broader view has been taken during recent years, the tendency still exists in the case of some sales engineers and salesmen of rubber products to tell very little regarding the nature of rubber and its processing methods. On the other hand they are prone to try to learn as much as possible about the consumer's requirements and then perfect a suitable compound without making it possible for the customer to give intelligent cooperation. While it is also true in other fields, the adoption of rubber as an engineering material will progress in proportion to the existing recognition of the fact that a common interest can best be served by coordination of all available facilities. Until the designing engineer is acquainted with the facts and taken into the confidence of the rubber technician, progress will be slow. In agriculture a rubber tire becomes a piece of equipment in competition with the steel tire, and the greatest factor in convincing the farmer to change to rubber is the impression he has obtained from his neighbor, his farm organization, or other sources aside from ordinary sales statements.

In extension work leading to greater use of rubber in the newer fields an atmosphere of mystery should be replaced by one of knowledge of the facts. An educational program, motivated by the intention to supply related information, is necessary if the full possibilities of this diversified material are to be realized.

The Crude Rubber Development Bureau, which was established in Washington, D. C., on October 1, is in an excellent position to assist impartially the rubber industry by dispensing reliable information which will enable the would-be user to know the true facts and thus clear up some of the misconceptions which still exist. Mr. Lockwood, director of the bureau, has chosen wisely in deciding to exert his early efforts along lines which have been in partial use, but in which much greater possibilities exist. In immediately concentrating on the use of rubber in agriculture this bureau can properly acquaint the farm organization, agricultural college students, and the manufacturers of farm equipment with such data as will build up a background of confidence in the ability of rubber to increase the efficiency of farm labor. His efforts deserve the hearty cooperation of the rubber industry.

Industry and the Public

PUBLIC opinion, or the voice of the great masses, is always present and exerts a great influence on industry, many times directly, but more often indirectly. In numerous instances too little consideration is given to a cross-sectional study of the views and desires of the public at large. Questionable practices can often be put into operation on a small scale; but if the effects are to be far reaching, public censorship must be reckoned, and the underlying principles must be fundamentally sound, for in general the people are rational and base their ideas on logical principles.

New products cannot be successfully marketed unless they meet with the consumers' approval. They must serve a purpose, be accurately represented, and be priced in proportion to the service performed. If not, the people will not accept them permanently, and their duration on the market will be temporary. Labor policies of companies or of employes become known and receive the attention of the general public.

Many other activities, both national and private, influence business through their effect upon the people, and eventually public opinion will make itself known. Successful undertakings must be based on a knowledge of the attitude which will be expressed in the final verdict of the people who are the eventual customers for the product, policy, practice, or legislation which is to be put into use.

EDITOR

What the Rubber Chemists Are Doing

A.S.M.E. Rubber Symposium

ON October 5 the newly formed Rubber and Plastics Subdivision of the Process Industries Division of the American Society of Mechanical Engineers held its first meeting and symposium on rubber at the regular fall meeting of the society, which convened in the Biltmore Hotel, Providence, R. I., October 5 to 7. The rubber symposium consisted of morning and afternoon technical sessions, at each of which two papers were presented with genuine interest being shown in the discussions by many of those present. The rubber engineers in attendance stressed the point that each of the thousands of possible compounds has its own characteristics and aptitude. The mechanical and designing engineers indicated that there was great need of a wider knowledge of rubber and its possibilities of adaptation to their problems. Of the 250 members and guests present at the A.S.M.E. sessions 40 attended the meetings of the Rubber and Plastics Subdivision. A meeting of the committee was held in the evening of October 5 to discuss the relation of rubber and plastics and formulated plans for coordinating present facts and promoting the establishment of further information essential to the mechanical engineer.

A general luncheon of the society on October 5 was presided over by Dr. Harvey N. Davis, president of the A.S.M.E. and president of Stevens Institute. Those present were welcomed by the Attorney General representing the Governor of Rhode Island and by the Mayor of Providence. Colonel Skinner, of the Rhode Island National Guard Engineers, told of the ravages of the hurricane and tidal wave in Rhode Island just two weeks previous. Dr. Henry M. Wriston, president of Brown University, discussed the place of the engineer in modern living. He emphasized the fact that no such poverty has existed since the coming of the machine as before and stated that there should be more scientists and engineers. The world will continue to advance, he said, and future problems will be solved so long as the will of mankind continues to be determined to progress.

At the morning technical session of the Rubber and Plastics Subdivision, presided over by Alton C. Chick, a paper was presented by Ernest R. Bridgwater, manager, Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., and in the absence of Dr. William C. Geer, research chemist, his paper was presented by Dr. F. Yerzley, chairman of the subdivision. At the afternoon meeting with James Orr presiding, papers by E. G. Kimmich, development engineer, The Goodyear Tire & Rubber Co., and by F. L. Haushalter, development engineer, The B. F. Goodrich Co., were well illustrated by projected plates. Everett W. Howe was recorder for both sessions.

Brief abstracts of the four papers are given below:

"The History of Rubber as an Engineering Material." W. C. Geer. The paper discusses some of the high points of the history of rubber compounding with the especial object of showing why it has been possible only within recent years to use rubber as an engineering material and why today it is possible to manufacture and use rubber successfully in a structure as a component part upon which the essential performance depends. The time has come when vulcanized rubber is a valuable engineering material, especially because of its ability to absorb shock and vibration. However much research work needs to be done before sufficent data and knowledge of rubber will be available to permit its use by engineers in machine design without test by trial and error.

"Synthetic Substances with Rubber-Like Properties." E. R. Bridgwater. The author states that rubber-like synthetics have little in common to each other and to natural rubber except the ability to stretch to several times their initial length before breaking. The properties of some of these synthetic products may be varied over such a wide range by compounding with other ingredients and vulcanizing under differing conditions that it is unsafe to generalize about any of them. Since the subject is so new and undeveloped, such terms as oil resistance, elasticity, abrasive resistance, and heat resistance are devoid of exact meaning, and if valid conclusions are to be drawn regarding these or any other physical properties, the methods of measuring these properties must be exactly defined. The only way to select the proper rubber-like synthetic product for any specific purpose is to analyze the conditions of service and prepare a composition with properties to meet the requirements of that particular application.

"Production Processes and Problems in the Rubber Industry." E. G. Kimmich. The paper shows how rubber goods are fabricated and discusses problems involved in their manufacture. By various examples it is shown that the products of the rubber industry have few limits as to size or utility other than those imposed by purely economic considerations. The rate at which new uses, processes, compounds, and rubber-like synthetic materials have been developed in the last few years serves as an indicator of future possibilities. The fact that rubber, as usually interpreted, is a variety of combinations of material with differing properties explains the vast field for its use and the multiplicity of processing methods employed.

"The Mechanical Characteristics of Rubber." F. L. Haushalter. The author presents some of the characteristics of rubber in which engineers may be interested from a design standpoint, without going into detail on every phase of the subject which might effect design. He points out that there is a vast amount of data still to be collected, especially to establish accuracy on some points that seem to be in doubt. He suggests that to obtain data accurately it will be necessary to conduct tests in rooms where humidity and temperature are closely controlled. The author presents data showing that moduli of elasticity and the creep of sheer and torsion springs are decidedly affected by temperature. Presented graphically are curves showing load-deflection, sheer and torsion characteristics of various rubber specimens including compression pads, rubber shear sandwiches, and torsion springs.

R. I. Rubber Club

THE Rhode Island Rubber Club's first meeting of the 1938-39 season, originally scheduled for September 30, but postponed because of conditions resulting from flood and hurricane, was held on October 21 at the Pawtucket Golf Club, Pawtucket, R. I., with an attendance of 64 members and guests. The dinner and meeting took place following a golf tournament held in the afternoon.

As Alan L. Grant, of Charles T. Wilson Co., Inc., 99 Wall St., New York, N. Y., was unable to be present, his

place on the program was taken by W. C. Meyer, of the same firm, who spoke on "Trading in Rubber." Mr. Meyer, basing his presentation on a paper prepared by Mr. Grant, discussed the dangers of speculation, the speculator's influence on price, and the sensitivity of the rubber market to rumors. It was pointed out that, while the rubber manufacturer was interested in only one market, the dealer was concerned with three: producer's, ownership, and consumer. The dealer's function as a market stabilizer was illustrated by hypothetical cases.

The next speaker, Robert A. Engel, manager, Industrial Aromatics Division of Givaudan-Delawanna, Inc., 80 Fifth Ave., New York, in a discussion on aromatic chemicals as used in the oil, paint, ink, and rubber industries, revealed that several years ago his firm approached the rubber industry to determine the possible use of aromatics in rubber and in most instances found that special preparations were necessary. Certain of these chemicals were found to be too expensive or to have certain accelerating or antioxidant effects which complicated development work and made necessary care in the selection of the proper aromatic. The speaker enumerated several aromatics which are used in drug sundries, erasers, mechanical goods, and reclaim, and pointed out that recent efforts have been directed toward their use in latex.

Winning teams competing for the Wishnick Golf Trophy during the year were announced by H. Thompson, of the Anaconda Wire & Cable Co., Pawtucket, who took over the chairmanship of the club's tournament committee upon the resignation of F. E. Rupert. The final standing of the four competing teams was as follows: (1) Respro, Inc.; (2) Anaconda Wire & Cable; (3) Davol Rubber Co.; and (4) Peddlers.

Winners in the golf tournament held before the meeting were: low gross for non-members, H. B. Simmons and L. Yates, both of Industrial Paper & Cordage Co.; low gross for members, F. F. Salamon, Binney & Smith Co.; J. Marshall, Collyer Insulated Wire & Cable Co.; C. Whatmaugh, Respro; low net for non-members, W. McGowan, Respro; low net for members, C. C. Mullens, L. G. Whittemore & Co.; S. T. Lake, Respro; blind bogey, J. Christophers, A. Schulman & Co., Inc.

Prizes were donated by: Fred S. Carver; Landers-Segal Color Co.; United Carbon Co., Inc.; National-Erie Corp.; Stewart-Bolling & Co.; Xylos Rubber Co.; Arnold Hoffman & Co.; John D. Lewis, Inc.; Sessions Gifford Co.; C. J. Tagliabue Mfg. Co.; Steel City Testing Laboratories; E. T. Trotter & Co.; Colonial Beacon Oil Co.; Baldwin-Southwark Corp.; Godfrey L. Cabot, Inc.; Cleveland Liner & Mfg. Co.; Continental Carbon Co.; Farrel-Birmingham Co., Inc.; Franklin Research Co.; General Atlas Carbon Co.; Pequanoc Rubber Co. W. Weller, of Wishnick-Tumpeer,

(*Continued on page 62*)

A.C.S. Rubber Division Activities

Election of Officers

THE Rubber Division, American Chemical Society, has announced the following newly elected officers for 1938-1939: chairman, G. K. Hinshaw, Goodyear Tire & Rubber Co., Akron, O; vice chairman, E. B. Curtis, R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y.; secretary, H. I. Cramer, University of Akron, Akron; treasurer, C. W. Christensen, Monsanto Chemical Co., Rubber Service Laboratories Division, Akron; sergeant-at-arms, E. H. Krismann, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; and executive committee, A. R. Kemp, Bell Telephone Laboratories, New York, N. Y., J. C. Walton, Boston Woven Hose & Rubber Co., Cambridge, Mass., A. W. Carpenter, B. F. Goodrich Co., Akron, G. S. Haslam, New Jersey Zinc Co., New York, and W. G. Nelson, United States Rubber Products, Inc., Detroit, Mich.; ex officio members of executive committee, C. C. Davis, Boston Woven Hose, and S. G. Byam, Rubber Chemicals Division, du Pont.

Boston Group

THE meeting of the Boston Group, Rubber Division, A.C.S., originally scheduled for November 4, has been postponed until December 2 so as not to conflict with the meeting of Rhode Island Rubber Club which was necessarily postponed because of the recent hurricane and flood. Dr. Ernst A. Hauser, of Massachusetts Institute of Technology, Cambridge, Mass., will be the principal speaker at the December meeting, and announcement of his subject will be made later. Another speaker upon a non-technical subject has not yet been chosen. At this meeting, which is expected to be held at the Fox and Hounds Club, officers will be elected for the ensuing year.

Los Angeles Group

WITH a record attendance of 129 members and guests, the Los Angeles Group, Rubber Division, A.C.S., held its first monthly meeting of the 1938-39 season on October 4 at the Mayfair Hotel in Los Angeles, Calif. Following the group's plan to have major rubber firms of the Pacific Coast sponsor programs, the evening's events were presented by the United States Rubber Products, Inc., through the courtesy of F. S. Carpenter, factory manager of the Samson plant, who acted as program chairman.

"The Adhesion of Rubber to Metal," a sound film prepared by J. D. Moron, of U. S. Rubber's Detroit plant, was shown with comments by A. F. Pond of the Samson plant. Dr. Arthur Bull, also of U. S. Rubber, presented a paper on "Tire Noises;" the wide variety of sounds produced by different types of tires in action were illustrated by sound reproductions.

Mr. Carpenter was the recipient of a huge balsa wood gavel, autographed by all those present and presented through the courtesy of Ed Royal, group chairman, and others. L. C. Weimar, of W. J. Voit Rubber Corp., won the door prize, 50 feet of garden hose; while the raffle prize, a rubber raincoat, went to Art Wolf, of New Jersey Zinc Sales Co. The prizes, including rubber aprons as table favors, were donated by U. S. Rubber. Other features of the evening were motion pictures of the summer fishing trip and dinner music by the American Hawaiian Orchestra. November 1 is the date for the next meeting, which will be held at Mayfair Hotel.

Chicago Group

THE first fall meeting of the Chicago Group, Rubber Division, A.C.S., will be held on Friday night, November 11, at the Hotel Sherman, Chicago, Ill. During dinner, which will be served at 6.45 p.m. in the College Inn of the hotel, the group will be entertained by Buddy Rogers and his orchestra, together with a floor show. Following dinner, members and guests will adjourn to the Louis XVI Room where they will hear Ernest R. Bridgwater, manager, Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., who will speak on "The Evaluation of Synthetic Rubber-Like Materials."

Akron Group

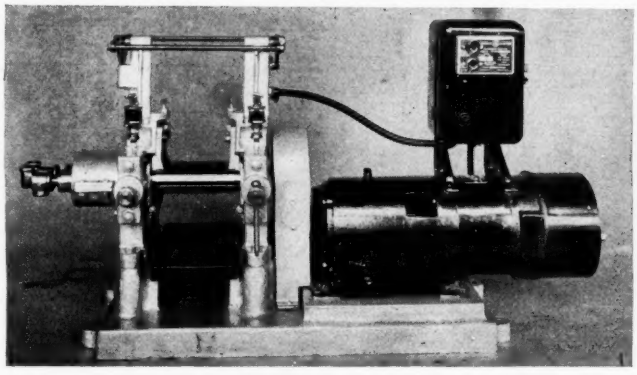
THE fall and winter meetings of the Akron Group, Rubber Division, A.C.S., are scheduled for November 11 and January 20, respectively, at the Akron City Club, Akron, O. The speaker at the November meeting will be Dr. William C. Geer. No announcement has yet been made regarding the subject of his address. At the January meeting William Welch, president, Midwest Rubber Reclaiming Co., will show his motion picture "Rubber Reborn." Plans are being initiated to complete the season's program with a spring meeting and a summer outing, details of which will be announced later.

S. C. I. Medalist

THE Chemical Industry Medal of the Society of Chemical Industry will be presented to Dr. J. V. N. Dorr, president, The Dorr Company, Inc., 570 Lexington Ave., New York, N. Y., at a joint meeting of the American Section of the Society of Chemical Industry and the American Chemical Society on November 4, with Dr. Wal-

(*Continued on page 62*)

New Machines and Appliances



Smallest Rubber Mill

Miniature Mill

BELIEVED to be the smallest machine of its kind, a two- by six-inch mill has been designed especially for small-scale laboratory work involving 10 to 50 grams of rubber. Within this range rubber can be broken down on the mill leaving sufficient room for compounding ingredients.

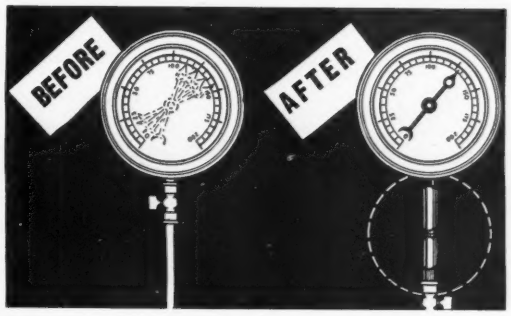
The mill which follows the design of the standard six- by 12-inch laboratory mill is equipped with two hardened steel rolls having hollow chambers to enable heating or cooling. The back roll revolves at 17.1 r.p.m., and the front roll, 15 r.p.m.; each roll is equipped with a removable scraper. One-piece adjustable guides, bored to fit the rolls, have shoulders to prevent the stock from accumulating in back of the guides.

The rear roll bearing-box of the semi-steel frame is solid bronze lined and provides definite alinement of the rear roll when the mill is set up. The front box is also bronze lined, and both boxes are designed to allow surplus oil to be led off by means of a trough, preventing the oil from seeping out on to the rolls and into the stock. Oil is supplied by sight feed cups. The neck gears are steel cut, one shrouded and one spur, running in an oil-containing cast-iron casing. The semi-steel master gear is of H-arm construction and operates in conjunction with the cut steel motor pinion which runs in oil. All gears are guarded.

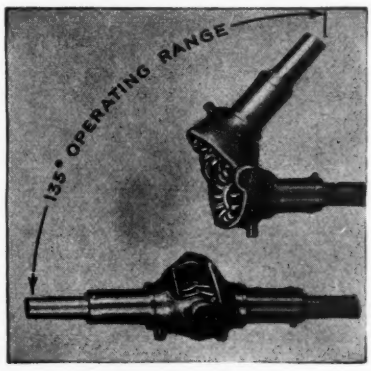
The mill is powered by a ½ h.p., single phase, 110/220 volt, 60-cycle planetary gear head motor. A motor mounted disk brake operates through a switch actuated by overhead bars for safety purposes; while a magnetic switch provides overload and undervoltage protection. Motor and mill are mounted on a one-piece cast-iron bedplate. The entire assembly may be placed on a laboratory bench or table. A three- by eight-inch mill with a two h.p. motor is made with the same type of construction. Wm. R. Thropp & Sons Co., Trenton, N. J.

Gage Shock Absorber

STEAM indicating gages can be protected from shocks resulting from pressure surges in the line by the introduction of a pressure snubber in the gage inlet pipe. The rise and fall of a piston within the snubber absorbs all shocks and surges in the conducting medium. In the accompanying illustration the effect of introducing the snubber (shown within the dotted circle of the right hand view) at the gage inlet is readily noted. The needle of the unprotected gage at the left is seen to be fluctuating nervously; while the needle of the protected gage is stationary, thus assuring accurate reading of the pressure. Besides, the snubber is said to assure longer accurate calibration and to minimize wear of delicate working parts of the gage. In addition to steam vulcanizer gages the snubber may be used on pump governors, flowmeters, water level controls, regulating valves, and other instruments which utilize fluids or gases as the working medium. Ray Pressure Snubber Co.



Effect of Pressure Snubber on Gage Needle



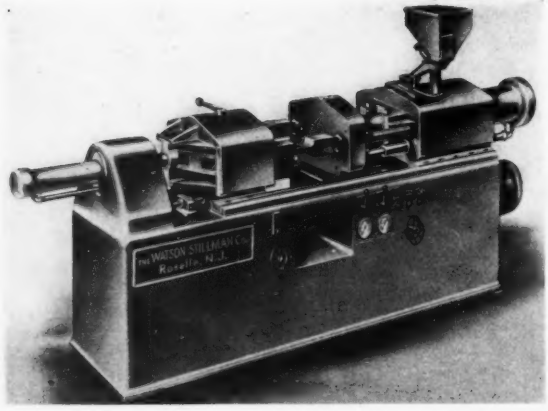
Universal Bevel Gear

Wide-Range Bevel Gear

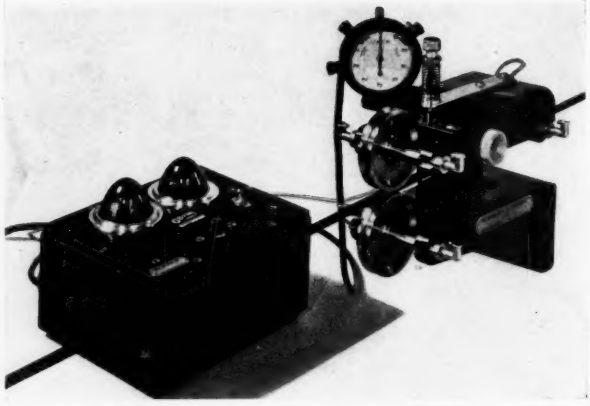
THE universal bevel gear, designed to operate freely and easily through an angle of 135°, is used as a connection between shafts operating at an angle. Solid steel gears within a hinged cast steel housing are said to operate and mesh accurately in any position between 45° and 180°. The bevel gear can be used in conjunction with valves difficult to reach or for other remote control applications and for quick assemblies of reach rods and extension shafts. Owing to the wide angular range one universal gear can be used to replace two or sometimes three universal joints having restricted transmission angles. No oiling is required unless operation is continuous. Condenser Service & Engineering Co., Inc.

Plastic Molding Machine

THE No. 6 Wasco hydraulic injection molding machine for the production of plastic molded parts is a self-contained unit, designed for manual, semi-automatic, or full automatic operation. There is a maximum opening of 24 inches between die plates, and the stroke on the clamping cylinder is adjustable up to 18 inches. Dies having up to 50 square inches projected area are held closed by a patented clamping device without transmitting strain to the rest of the machine. The heating cylinder has increased plasticizing capacity, and concentrated heating is unnecessary, thus eliminating one of the main causes of burned material. As the bore of heating cylinder is smooth and of uniform diameter, there is no place for material to lodge, an advantage when changing from one color to another. When operated automatically, the timing device may be set



Injection Molding Press



Watchman Connected to Comtorgage

for one cycle to six cycles per minute. The Watson-Stillman Co.

Watchman for Wire Gage

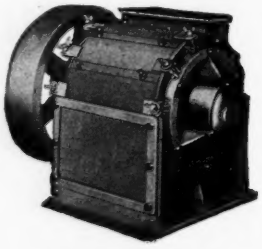
THE Comtor Watchman, when used in conjunction with a Comtorgage W1, is a device for indicating by colored lights the correctness of gage of rubber covered wire as it comes off a tubing machine.

With the Comtorgage, which has been used in the wire industry for a number of years, the wire is gaged between two 90° V-grooved rolls which give four-point contact around the circumference. An adjustable vertical counter-balance spring provides the correct pressure on the contacts for the material being gaged. When the gage is being set, the arm carrying the dial indicator is adjusted with the correct size material or reference rod between the gaging rolls so that the indicator reads zero. Comtorgage W1 will operate on rubber covered wire as small as 0.06-inch diameter and on rubber covered cable up to 1¼-inches. The instrument may also be adapted to gage a variety of flat continuous strip materials by using special rolls.

The purpose of the Watchman is to give a quick visual check of size correctness as measured by the Comtorgage. When the gage of the wire is correct, a green light shows, but when incorrect, a red light is shown. The Watchman consists of a dust-proof box containing apparatus to produce a high-tension current from the lighting circuit and the necessary apparatus to control the lights. This apparatus is connected electrically to a special bezel containing adjustable limit posts and located on the indicator dial of the Comtorgage. The limit posts are set about ½ graduation wider than the desired size limits, plus and minus. As the dial pointer comes within ½ graduation of either limit post, a spark jumps across, closing the relay in the Watchman and changing the light from green to red. This red light remains on until the tubing machine has been adjusted, and the button marked "reset" is pressed. Pressing the "reset" button will not restore the green light until the diameter has been returned within the tolerated limits. The Watchman uses standard 120 volts A.C. and may be installed on a stand adjacent to the tubing machine. The Comtor Co.

Deavy-Duty Knife Cutter

A STURDY, compact knife cutter was recently developed for cutting, cracking, granulating, flocking, fiberizing, and shredding many kinds of plastic, tough, or fibrous materials such as old rubber tires, leather scraps, plastic compounds, pulp, rags, and felt. The knife frame consists of cast-steel flanges, to which the steel knife bed bars are welded. A removable cover plate in front of each stationary knife allows the operator to inspect and adjust the clearance between the revolving and the stationary knives. The knives are extra heavy, and the cutting edges are faced with inserts of high carbon steel. The revolving knives are attached to a heavy steel spider, rigidly keyed to a heavy shaft. Removable cylinder ends are cast integral with the bearing housings which support heavy duty self-alining bearings. Seal rings around the shaft make the machine dust-proof. A semi-circular interchangeable screen which forms the lower half of the cylinder holds the material within the cutting chamber until it is fine enough for passage through the perforations. The balance wheel is fitted with wood shear pins that will shear off and protect the machine from damage should any metallic substance be accidentally introduced into the cutting chamber. Robinson Mfg. Co.



Compact Knife Cutter

Motodrive with Automatic Control Mechanism

Variable-Speed Control

A MECHANICAL automotic control was recently developed for use with the Reeves Motodrive,[1] a variable speed control unit which combines speed control mechanism, motor, and gear reducer in one assembly. The new control provides entirely automatic speed regulation of the Motodrive to make possible synchronization of different machines and separate sections of a single machine; maintenance of constant tension and uniform peripheral winding speeds; and maintenance of uniform pressure, liquid level, temperature, and other variable elements.

On the motor (constant speed) shaft of the Motodrive is a cover plate with a lever bracket and extended lever which may be attached directly or by cable or chain to the part of the machine from which an indication of required speeds can be taken. Movement of the lever is transmitted to the speed changing mechanism of the Motodrive to change its speed in accordance with the indicating movement, thus providing automatic control. Travel of the lever in either direction is limited by stop screws. The lever may be of any reasonable length, and may be assembled in any one of four different positions. Reeves Pulley Co.

[1] India Rubber World, Sept., 1937, p. 63.

New Goods and Specialties

Duoweld Oxy-Acetylene Hose

Hose Developments

RECENT developments in rubber hose have led to the introduction of several new lines, examples of which are described below.

Welding Hose

Duoweld oxy-acetylene hose, introduced by The B. F. Goodrich Co., consists of two parallel, ¼-inch hose with two-braid construction and corrugated cover, molded together as a single unit. Each length is separated and secured with metal ferrules about a foot and a half from the ends for easy attachment to equipment. To aid in identifying the acetylene from the oxygen line, the cover on one line is red, while the other is green. Duoweld is made in 12½-, 25-, and 50-foot lengths.

Style HD safety welding hose, a product of The Goodyear Tire & Rubber Co., for oxy-acetylene service, combines fire resisting compounds with fabric and asbestos insulation in such a way that the danger of spontaneous explosion is minimized considerably. Construction of the hose follows: (1) tube of high grade non-porous rubber; (2) three plies of closely woven fabric; (3) heat resisting rubber lining; (4) braid of asbestos cord; (5) rubber cover of high abrasion and heat resistance.

Rotary and Fire Hose

The Goodyear rotary hose, Style 3,154, is designed for service within the 1,500-pound working pressure range. The hose has a tough rubber tube; the body structure consists of multiple plies of extra-heavy duck and two distinct layers of bead wire spiralled in opposite directions and embedded in rubber. Each layer of wire is insulated from the other by rubber and duck, and a third bead wire is used at each end for additional strength. The cover is of abrasion-resistant rubber. These features, which provide 7,000-pound burst construction, are said to prevent kinking or crushing while allowing maximum flexibility.

Goodrich has developed the Highflex fire hose to meet the demand for greater flexibility. Refinements in weaving, the use of special yarns, and improved rubber compounds have enabled the reduction of wall thickness by 1/32-inch. Through the use of a slightly oversize tube, the outside diameter remains the same as that of the standard hose, which permits attachment of standard couplings. Highflex has the same strength and burst-resistance as standard fire hose and is made in the 2½-inch size.

Oil- and Gasoline-Resistant Hose

Air drill hose, known as Grenadier-G.O.P. and made by The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., is constructed with an inner tube of oil-resistant synthetic rubber for use on air compressors and in other service where oil is present in the line. The exterior construction consists of two or three braids of cotton cord with a layer of rubber between braids and vulcanized to form one inseparable unit. Added durability is gained by the use of a heavy abrasion-resisting rubber cover. Grenadier hose is made in all regular sizes from ¼-inch to two inches.

Another Manhattan product, Paranite-G.O.P. gasoline pump hose (Style R-W), is designed with a gasoline-proof synthetic rubber tube, smooth to give a full, fast flow. Light in weight and flexible, the hose is of rugged construction to withstand crushing with two plies of braided cord and a spiral of hard steel wire bound by rubber into a solid unit. Paranite has a gasoline- and oil-resistant cover and is statically grounded from coupling to coupling.

Kedettes Stompers

Women's Sport Shoe

THE Stomper, young ladies' sport and dancing shoe, is the name given to a new style Kedette which features a thick sole of vulcanized crepe with a layer of cork for lightness and comfort. The shoe with an upper of heavy tire duck is washable in soap and water. Made in a wide variety of styles and colors and with three different heels, Stompers are designed for late summer, fall, and winter wear, and, because of their thick soles, are said to be suited for tramping, modern novelty dancing, and general sports wear. A feature style shown on this page is a special leopard print oxford with the wedge heel. United States Rubber Products, Inc., 1790 Broadway, New York, N. Y.

Rust and Burr Cleaner

SHINEBOY, a rubber composition impregnated with fine emery and pumice, is used for cleaning rust, fine burrs, etc., from reeds and heddles that are employed in the textile industry. It polishes as it cuts off rust and burrs and will not scar or roughen up the finely polished surface of reed dents and heddles. Greensboro Loom Reed Co.

Shineboy Cleaner

Safety Welding Hose

Rubber Industry in America

OBITUARY

Russell J. Hawn

AFTER a lengthy illness Russell John Hawn, a vice president of Monsanto Chemical Co., St. Louis, Mo., died at his home in Birmingham, Ala., on October 14. He was in charge of operations of Monsanto's phosphate division. During his business and engineering career he had been associated in the cement business with Lindley C. Morton and had been a vice president of the Swann Corp., acquired by Monsanto in 1935.

Mr. Hawn, who was born in Stevens Point, Wis., on March 8, 1878, belonged to the Church of the Advent, Birmingham Country, Engineer's, and Rotary clubs, and Associated Industries of Alabama.

Surviving are his wife, a daughter, a son, and a brother.

Funeral services were held on October 16 at the Hawn residence. Interment was in Elmwood Cemetery, Birmingham.

H. M. Dannenbaum

FOLLOWING an appendectomy, Harry M. Dannenbaum, president of Schwarzwaelder Co. and Aldan Rubber Co., both of Philadelphia, Pa., died on September 15. After graduating from the grade and high schools in Philadelphia, where he was born May 3, 1872, Mr. Dannenbaum went to work and in 1888 became associated with Louis Schwarzwaelder, who had built up a waterproofing business. After its founder's death in 1892, Mr. Dannenbaum took over the concern. Then, 33 years ago, recognizing that rubberized fabrics had become important to the sale of waterproof fabrics in the clothing industry, the deceased established a rubberizing division of the company, which operated in a separate plant. When, however, the steady growth of this division demanded larger quarters about a decade ago, a new and more spacious plant was purchased, and a separate company was formed, Aldan Rubber Co.

Mr. Dannenbaum was vice president of the Skin and Cancer Hospital and also was very active in other philanthropies.

He leaves his wife, a daughter, and two sons, Albert K. and Harry M., Jr., both executives in their father's organization.

Funeral services were held September 18. Interment was in Mt. Sinai Cemetery.

Robert J. Stokes

ROBERT JOHNSTON STOKES, president and general manager of the Joseph Stokes Rubber Co., Trenton, N. J., died suddenly on October 19 from a heart attack. Son of the late William J. B. Stokes, prominent rubber manufacturer, he followed his father's footsteps in that business for many years. He was born in Trenton, November 23, 1883, and after attending the State Model School there entered Princeton University, from which he was graduated in 1904. During vacations at Princeton he made rubber horseshoes and other products at the plant of the Thermoid Rubber Co., Trenton, of which his father was president. Then following graduation he did general work at the Thermoid plant and became foreman, then superintendent and general manager. He later was named secretary and a director and afterward president. He resigned in 1934, and two years later was elected president of the Stokes company, which was founded by his grandfather.

During the World War, Mr. Stokes was made captain of the Home Guards at Trenton. He was also a member of the Trenton Chamber of Commerce, State Street M. E. Church, the various Masonic bodies, and Trenton Country Club; a director of the Trenton Banking Co. and Mercer Hospital; a trustee of the Carolyn Stokes Day Nursery; and a former president of the Asbestos Brake Lining Association. His hobbies were golf, fishing, and antiques.

Mr. Stokes is survived by his wife, a son, William J. B. Stokes, Jr., two sisters, and his mother.

Private funeral services were held at the Stokes residence on October 22. Burial was at Ewing Church Cemetery.

Joseph A. Roberts

JOSEPH A. ROBERTS, 52, a member of the firm of Pierce-Roberts Rubber Co., Trenton, N. J., died at his home on October 5, after a long illness. He is survived by his mother and a brother, Harry W. Roberts, with whom he was associated in the rubber business. The funeral was held in Trenton, and burial was at South Akron, O.

Charles E. Duryea

CHARLES E. DURYEA, known as "The Father of the Automobile," died at his home in Philadelphia, Pa., on September 28 after a lengthy illness. Mr. Duryea was also the first to equip an automobile, the third he had made, in March, 1895, with pneumatic tires, which had been built in 1894 by the Hartford Rubber Works. This car won the first American automobile race under very unfavorable weather conditions on Thanksgiving Day, 1895. Mr. Duryea's first two cars had had solid rubber tires.

The deceased was born near Canton, Ill., December 15, 1861. He attended school and also helped on the farm. Always interested in mechanics, he built his own bicycle at the age of 17. Besides he took two three-year courses at Gitting's Seminary, La Harpe, Ill., and as his graduating thesis in 1882 presented "Rapid Transit Other Than on Rails," predicting flying machines and half-day flights to Europe.

Mr. Duryea invented various bicycle improvements and in 1884 became interested in motor carriages. He completed his first successful one on April 19, 1892, in Springfield, Mass. He organized his own company in 1895 and made automobiles until 1914. For 15 years this inventor edited the mechanical and technical department of *The Auto Trade Journal*. He also authored "Roadside Troubles" for the American Motor League, besides serving as its first president from 1895 to 1902. Mr. Duryea, furthermore, assisted James E. Homan to write "Self-Propelled Vehicles." The deceased since 1914 continued his association with the automotive industry as consulting and patent engineer, authority on automobile history, and museum consultant.

EASTERN AND SOUTHERN

BUSINESS conditions in this country have been overshadowed by the critical events abroad. It is reported, nevertheless, that industrial activity has recovered from the low point of the renewed depression so that now it is at the high point for the year. Although aggregate output for the first eight months of 1938 was one-third less than for the similar period last year, it is believed that business from now on will make a much better showing compared with the corresponding period in 1937 because of the improvement that has occurred since the slump last fall. A study of present conditions, however, emphasizes the still depressed level of business and the need of a fall revival, aided by a new vigor in business enterprise.

Steel mills were running at 54% of capacity the week of October 24, the highest rate since October 18, 1937. Still the volume of new business is disappointing although the betterment is seasonal, with, however, almost no orders from railroads and only fair demand from the automobile industry. Employment and earnings likewise record sustained advances. Other encouraging news includes the spurt in cotton goods buying, an uptrend in coal operations, a large gain in household electrical appliance sales, and a steady rise in plumbing and heating equipment orders reflecting the recent expansion of the building industry, which expects to continue its improvement even through the new year. Shoe plants throughout the country maintained schedules in a period usually marked by declining orders. Airplane factories, furthermore, report better orders. Besides good crops are being harvested.

The last few weeks witnessed a moderate improvement in orders for rubber footwear, mostly galoshes and unlined rubbers; while, however, trade in boots, heavy arctics, and other heavy goods has been quiet. But total buying has been much below that of last year. Owing to the comparatively mild last winter dealers' rubber footwear stocks are rather large although inventory in the lighter lines are under current beliefs. Manufacturers' stocks also have been kept down with low production because of small advance buying. Prices for rubber footwear remain about the same as during last year, which were the lowest in about 15 years.

Patent Digest Announced

The Bureau of National Affairs, Washington, D. C., has announced the publication of "Cumulative Patent Digest for Volumes 26 to 37 (July, 1935, through June, 1938) of The United States Patents Quarterly," reporting cases relating to patents, trade marks, and copyrights decided by the federal courts, Commissioner of Patents, and the Patent Office Board of Appeals. The price of the digest is $12, postpaid.

Correction

Neoprene Type E Price Reduction Date

On page 51 of the October issue the announcement of Neoprene price reduction erroneously stated that the price of Type E was reduced during August. The price reduction on Neoprene Type E, Type M, and Type G became effective simultaneously on September 26, 1938. For reference purposes, the price of $0.65 per pound for Type E shown on page 80 of the September issue should be corrected to $0.75 as this reduction did not become effective until September 26.

The National Automobile Show will be held in Grand Central Palace, New York, N. Y., eight days beginning November 11. To inaugurate this event a luncheon will take place on November 10 at the Advertising Club of New York to be attended by numerous automobile company executives and other nationally prominent figures. The International Day luncheon-conference, to be attended by several hundreds including representatives of foreign automobile interests, is scheduled for November 14 at the Ritz-Carlton Hotel. This is an annual feature sponsored by the Automobile Manufacturers Association, which anticipates for 1938 a car production of 2,300,000 units and for 1939, 3,000,000.

The American Society of Mechanical Engineers, 29 W. 39th St., New York, N. Y., on September 27 elected, as follows, new officers who will be inducted December 9: president, Alexander G. Christie, professor of mechanical engineering, John Hopkins University, Baltimore, Md.; vice presidents, Henry Snelling, Snelling & Hendricks, Washington, D. C., Wm. Lyle, vice president in charge of design and sales, Western Blower Co., Seattle, Wash., Alfred Iddles, application engineer, Babcock & Wilcox Co., New York, James W. Parker, vice president and chemical engineer, Detroit Edison Co., Detroit, Mich.; managers, Clarke Freeman, vice president in charge of fire prevention, engineering, and underwriting, Manufacturers Mutual Fire Insurance Co., Providence, R. I., Wm. H. Winterrowd, vice president, Franklin Railway Supply Co., Chicago, Ill., Willis R. Woolrich, dean of engineering, University of Texas, Austin, Tex.

Lee Rubber & Tire Corp., Conshohocken, Pa., in announcing a final dividend of $2 a common share, through President John J. Watson stated: "Our fiscal year ends on October 31. The earnings are running well ahead of last year, and the board felt that as our company is still operating under the undistributed profits tax, it was wise to pay out a substantial part of the earnings in dividends rather than retain them for working capital under terms which would require the payment of the excessive undistributed profits tax. This makes total dividends paid this fiscal year $2.50 a share, compared with $1.60 last year."

Brake Lining Manufacturers' Association, Inc., 370 Lexington Ave., New York, N. Y., on September 28 held its annual meeting at which the following officers were elected for the ensuing year: president, E. S. Crosby, of Johns-Manville Corp., 22 E. 40th St., New York; first vice president, T. L. Gatke, Gatke Corp., 226 N. La Salle St., Chicago, Ill.; second vice president, W. C. Dodge, Jr., Ferodo & Asbestos, Inc., New Brunswick, N. J.; treasurer, J. S. Crawford, Johns-Manville; C. A. Ekwall, secretary, general manager, and assistant treasurer; executive committee, Messrs. Crosby, Gatke, Dodge, and Crawford, F. E. Schluter, Thermoid Co., Trenton, N. J., F. J. Bowers, Scandinavia Belting Co., 250 Central Ave., Newark, N. J., R. B. Davis, Raybestos-Manhattan, Inc., 1354 Bostwick Ave., Bridgeport, Conn., H. A. Gillies, American Brakelok Division of American Brake Shoe & Foundry Co., 4660 Merritt St., Detroit, Mich., and H. D. LaMont, Asbestos Mfg. Co., Huntington, Ind.

Carl M. Loeb, Rhoades & Co., 61 Broadway, New York, N. Y., recently announced the appointment of Fred. T. Koyle as manager of its rubber department.

The Thirteenth National Exposition of Power and Mechanical Engineering will be held at Grand Central Palace, New York, N. Y., the week of December 5. More than 230 manufacturers have already engaged exhibit space, and more than 40,000 registered visitors are expected.

U. S. Rubber News

Francis B. Davis, Jr., president, United States Rubber Co., 1790 Broadway, New York, N. Y., when in Montreal early in October to attend a meeting of the directorate of Dominion Rubber Co., Ltd., stated business in the United States is definitely improving.

The company's footwear plant at Naugatuck, Conn., expects to recall a number of workers because of the quantity of advance orders, based on new season's samples, received by U. S. Rubber salesmen.

The footwear plant last month ran a safety poster contest for employes to deal with possible accident hazards in the factory. A cash prize was awarded each week for the best poster. The contest is part of a campaign by the establishment to achieve the best footwear record for safety in the country. W. L. Duncan is safety supervisor.

Elmer Roberts, vice president of United States Rubber Products, Inc., and general manager of the Naugatuck Chemical Division, announced that on October 24, Dr. Wm. F. Tuley, in charge of rubber chemical research and sales service of Naugatuck Chemical, Naugatuck, Conn., was transferred to the New York office where he has taken up his duties as assistant to Mr. Roberts.

Opening of Crude Rubber Development Bureau

On October 1 the Crude Rubber Development Bureau, in the Munsey Bldg., Washington, D. C., was opened by rubber producing interests as part of the program under Article 19 of the International Rubber Regulation Agreement of May, 1934, to further research into and publicity for new and increasingly important uses of rubber. This office was initiated by the British Rubber Publicity Association to conduct a campaign in the United States like that developed during the past year in England and Empire countries. Because of the ever-broadening scope of the rubber industry the bureau for its initial year contemplates concentrating its activities on the advantages of large-scale uses of rubber in agriculture.

This bureau will constantly keep in touch with agricultural universities, research bodies, and farm trade organizations throughout the nation to maintain an informational service for rubber and farm equipment manufacturers, to supplement or verify data obtained by individual firms. The Crude Rubber Development Bureau hopes to serve as a liaison between rubber manufacturers and tractor and implement companies to place matters of mutual benefit on a cooperative basis. It will gather non-confidential data from government offices of appeal to rubber concerns in farm equipment business and will try to further the interest of government and trade organizations in such important problems as standardization of wheel sizes and inclusive farm census coverage.

A campaign featuring the advantages of rubber tires on tractors, farm implements, and wagons and other educational information will be conducted in national and trade publications, through pamphlets, letters, lectures before colleges and farm organizations, and occasionally by fair exhibits, motion pictures, and radio talks. Periodic bulletins will be distributed gratis beginning January 1. Included in these various releases will be material received from the British, Dutch, and French research and publicity organizations set up under the international agreement.

Underwood & Underwood

Warren S. Lockwood

Warren S. Lockwood, director of the Crude Rubber Development Bureau, has for the last nine years been associated with the foreign service of the Bureau of Foreign and Domestic Commerce in the Far East and Great Britain and has acted as American assistant trade commissioner in Singapore, Batavia, and London. For two months this summer he traveled in Great Britain, Germany, Czechoslovakia, France, and Holland, where he studied the surprising progress in the use of rubber on the farm and contacted manufacturers, universities, and government and trade officials from whom data will be forthcoming regarding the latest development abroad. Mr. Lockwood upon his return to the United States also visited rubber and farm equipment manufacturing centers in New York, Akron, and Chicago, besides many agricultural colleges.

The proposals under the 1934 restriction scheme resulted in establishing, on an international basis, producer organizations to cooperate with rubber manufacturers in increasing crude rubber consumption by developing the demand for and enlarging the range of the industry's varied output. Consequently the following were formed: International Rubber Research Board and International Rubber Propaganda Committee, consisting of English, Dutch, and French Delegates; the Rubber Foundation, Amsterdam, Holland; Institut Français du Caoutchouc, Paris, France; and the British Rubber Producers' Research Association and British Rubber Publicity Association, London, England.

Factors Influencing Carbon Black Flow

Controlling the rate of flow of dustless black through the Banbury charging apparatus is highly important, users have found. To facilitate solution of this problem, Continental Carbon Co., 295 Madison Ave., New York, N. Y., which supplies large quantities of dustless black in specially constructed tank cars, recently built a replica of a customer's charging apparatus and conducted experiments on dustless black made under varying conditions and varying apparent densities. Information gained during this study demonstrated that the factors of density and percentage of fines must be taken into account in order to control the rate of flow desired through a given piece of charging apparatus.

Independent Tire Dealers Meet

Outstanding independent tire dealers from 32 states attended the eighteenth annual convention of the National Association of Independent Tire Dealers at New Orleans, La., October 10, 11, and 12 and participated in discussions on merchandising problems.

At the concluding session the association adopted resolutions calling for major reforms in merchandising practices and volunteering its cooperation with the government in any investigation that may be made of the tire manufacturing end of the industry.

The dealers protested the manufacturers' practice of selling "seconds" and "discontinued design" tires through other than regular dealer channels, asked the Bureau of Standards to require tire makers to brand tires as to grade, urged the adoption of a special contract with dealers covering the sale of truck and commercial tires, advocated the filing of tire prices under the Fair Trade Acts of the 42 states having such laws, endorsed the Patman Chain Store Bill and the bill aiming to divorce manufacturing from retailing, and approved a three-point uniform highway safety program featuring the slogan "A Smooth Tire Is Not a Safe Tire."

Three morning sessions were devoted to retreading and recapping shop problems and excited considerable interest, particularly on the question of guarantees and cost finding.

William J. Coughlin, of Indianapolis, Ind., was elected president, succeeding Walter H. Schlichtmann, of San Francisco, Calif. It was decided to hold the 1939 convention in San Francisco.

Revertex Corp. of America on November 1 moved its offices from 80 Broad St., New York, N. Y., to One Main St., Brooklyn, N. Y., in order to unite all its activities under one roof and thus render customers even more efficient and more prompt service.

Everett G. Holt, chief, Leather and Rubber Division, United States Department of Commerce, Washington, D. C., on October 6 addressed the Akron Export Club at Akron City Club.

Anderson Discusses Tire Cord

The New Orleans Convention of the National Association of Independent Tire Dealers at New Orleans, was addressed on October 12 by W. D. Anderson, president of the Bibb Mfg. Co., Macon, Ga., on the subject, "Recent Developments in Tire Cord Fabrics and Heat Resistant Cord versus Rayon." Mr. Anderson traced the history of cotton as a reenforcer for rubber in tires from the early square woven duck made of Sea Island cotton, which sold as high as $3 per pound and finally became very scarce as a result of boll weevil, through the days of the less costly Egyptian cotton and the later discovery that the long staple cotton grown in the Delta of the Mississippi was particularly satisfactory for the cabled cord on which experiments were then being made down to the low-stretch heat resistant cord now used in tire manufacture.

In the former days the resiliency and elasticity of the Delta cotton was desirable as it was believed that high stretch cord was necessary. About the time of the advent of the low pressure tire a trend was started away from the high stretch, very elastic cord toward a low stretch, low gage, and high density cord, and it was while experimenting with this new type of cord that his company discovered this new process by which its Heat Resistant Cord is produced.

Describing this Heat Resistant Cord as the most important development in the construction of automobile tires since the adoption of cord fabric, Mr. Anderson said that in its bone dry state it retains approximately 92% of its original tensile strength with its normal moisture content of 6½ to 7%, whereas the ordinary type of cotton cord under the same test shows about 77%. Other claims made for Heat Resistant Cord were that it recovers more quickly and completely from fatigue; retards rubber separation from the cord; and minimizes tire growth.

Emphasizing the importance of using the right grade of cotton for tire cord, Mr. Anderson went on to compare the value of Heat Resistant Cord with Rayon cord: "I will venture the assertion that, size for size, diameter for diameter, and weight for weight, a cotton tire cord made of 1¼-inch cotton, grown in the Mississippi Delta, will have greater tensile strength than a rayon cord when both are in a normal state, that is containing the normal moisture content of the atmosphere, and, what is more important still, will be stronger than a rayon cord when both are reduced to a bone dry state, which is the state in which the cord performs in a tire.

"It is quite true that when you reduce a rayon cord to the bone dry state, its tensile strength shows a temporary increase, and for this temporary period it comes more nearly to equaling the tensile strength of the Heat Resistant Cotton Cord than it does at any other time.

"It is equally true that when the rayon cord and the Heat Resistant Cotton Cord are both subjected to excessive temperatures over a long period of time, the loss in tensile strength in the rayon is more rapid and is far greater than is the loss in tensile strength of the Heat Resistant Cord."

Mr. Anderson then discussed the comparative cost, reaction to moisture, and receptivity to rubber and concluded with the statement, "No known fiber combines the remarkable tensile strength of cotton, with its flexibility, its resiliency, and its ability to stand punishment."

N.A.W.M.D. Doings

The fall convention of the National Association of Waste Material Dealers, Inc., Times Bldg., New York, N. Y., held October 17 to 19 at Sir Francis Drake Hotel, San Francisco, Calif., witnessed an unusually large registration from all sections of the country.

Golf Tourney

Approximately 80 dealers attended the third annual golf tournament and outing held under the auspices of the New York Luncheon Club of the association at the Green Meadow Country Club, Harrison, N. Y., on October 3. Many attractive prizes were awarded at the dinner and entertainment in the evening. The directors' cup, donated by Julius Muehlstein, went to Conrad Ambrette, of Consolidated Baling Machine Co.

Tire Prices Boosted

Tire prices were raised last month by United States Rubber Co., 1790 Broadway, New York, N. Y. The range, running from 2 to 5%, covers larger sizes, truck, bus, and rayon tires, but not the popular sizes. Except for minor adjustments this new schedule marks the first price advance in the industry since October, 1937.

The following week came similar announcements from The B. F. Goodrich Co. and General Tire & Rubber Co., both of Akron, O. The Goodyear Tire & Rubber Co., Akron, then stated it, too, was making minimum increases in inactive lines of auto and truck tires.

The rising cost of crude rubber and of other factors are responsible for the adjustment, estimated to average about 1% on all tires sold.

General Electric Co., Schenectady, N. Y., on October 17 celebrated its sixtieth birthday.

NEW JERSEY

VERY little change in the rubber industry is indicated at this time although some plants announced an improvement, while others experienced a decline in output. Rubber tiling has shown an increase, and heel and sole production is holding its own.

Thiokol Corp., Trenton, according to President Bevis Longstreth, found September its best month in several years. Judging from orders, the firm believes output will continue good during the winter.

William H. Sayen, president, Mercer Rubber Co., Hamilton Square, is on a month's business trip through the South and Midwest.

Pocono Co., Trenton, experienced declining business recently.

Jos. Stokes Rubber Co. and **Crescent Insulated Wire & Cable Co.,** both of Trenton, recently were partly flooded by the high waters of Assunpink Creek. The damage, however, was not serious and did not interfere with plant operations.

Essex Rubber Co., Trenton, finds business moving upward with prospects better for the late fall trade.

Holland B. Slusser, former secretary-treasurer of the Pocono Co., Trenton, returned with his wife after seven months abroad.

Acme Rubber Mfg. Co., Trenton, experiencing improved business, expects it to continue. Marie G. Connolly, wife of Treasurer Edward F. Connolly, died recently after a long illness.

Michelin Tire Co., Milltown. A portion of this old plant has been leased to a manufacturing concern.

Luzerne Rubber Co., Trenton, saw no improvement in hard rubber production. President Bruce Bedford was named to the general committee of the Trenton Community Chest campaign.

Whitehead Bros. Rubber Co., Trenton, reported business for September ahead of the same month last year. August also showed improvement.

Puritan Rubber Co., Trenton, is receiving increased orders for rubber tiling. Officials now hope for a steady improvement.

ELEVATOR PRECAUTIONS. Temporary cabs should have a strong roof capable of stopping falling objects and protecting passengers. . . . Do not put heads or arms into a hatchway being used for temporary service. *National Safety Council.*

OHIO

BUSINESS is improving in Ohio, and employment is up.

Things seem to be picking up also for the rubber industry. A recent survey of stock averages showed a gain of 10.63% in one week for rubber stocks. For a while the war scare threatened the future supply of rubber in this country; but now this danger seems removed for the present. Rubber consumption in the United States has been increasing the last several months, and this trend is expected to continue. One factor is that tire manufacturers anticipate a good original equipment demand for 1939 cars by the automobile industry.

Another encouraging feature is the rise in the use of rubber tires on farm equipment. With 1938 volume maintained at about the 1937 mark sales of tractor and farm implement tires and tire sundries this year are figured to reach last year's total of $20,000,000, to constitute the largest proportion of tire sales since this type of casing has been manufactured. Even though volume has gained rapidly since 1932, when such tires first were used, the potential demand still is quite large, to form a very profitable market for the tire manufacturer. Wheeled tractor output this year will run, it is estimated, between 15 to 40% lower than for 1937, but about 15% more machines are being equipped with rubber tires. According to a recent survey 60% of the tractors will have rubber tires and 40% will be steel wheeled this year; the respective proportions in 1935 were 14.3% and 85.7%. Running abreast with increased sales for new equipment tire sales are the sales for tires used in changeover from steel to rubber. This year, the figure naturally decreasing with the increase in original equipment tires, the changeover sales will average about 40% of total tractor tires sold. An estimate reveals that there are now in use about 50,000,000 implement wheels with only a small proportion rubber tired.

Goodyear Activities

The Goodyear Tire & Rubber Co., Inc., Akron, is expanding its Pliofilm sales division to broaden the scope of its activities. In consequence W. C. Winings, manager, mechanical goods division, announced the following appointments: A. F. Landefeld, manager, Pliofilm Sales, in charge of all Pliofilm sales; A. B. Clunan, since 1937 in the packaging department of Pliofilm Sales, promoted to manager of Packaging Sales; E. B. Brewster, formerly of Goodyear's LifeGuard sales department, assigned to the Pliofilm division in charge of sales promotion; William J. O'Keefe, with several years' experience in the transparent wrapping and packaging field, assigned to the company's New York, N. Y., office, 600 W. 58th St., to handle Pliofilm sales in that market; H. R. McCleary, formerly of Sylvania Industrial Corp., New York, assigned to supervise Pliofilm sales in the Chicago, Ill., territory, with headquarters at the company's district office, 407-19 E. 25th St.

Practical Submersion Test of Goodyear Airplane Tire Tubes Continues to Be a Part of Regular Inspection

Commenting upon the increased sales facilities, the second such revision this year, Mr. Landefeld stated the Pliofilm sales graph for the year to date has shown a substantial increase each month.

Assigned to Swedish Plant

Vice President C. C. Slusser recently announced that Val Follo, division superintendent at the Gadsden, Ala., plant since 1929, has been named general superintendent of Goodyear's new factory at Norrkoping, Sweden.

E. O. Malmquist, of the Akron development department, last month sailed for Sweden where he will be temporarily in charge of Tech Service.

Other factory executives are being chosen and squadron men groomed to train the Swedish workers when the new plant begins operations early next year.

Thirty Years with Airplane Tires

As October 1-9 was Air Travel Week, attention was focused on the progress of the past decade in scheduled air transportation.

Hand in hand with the development of air transportation has gone the rapid development of airplanes themselves and the accessory equipment going into their manufacture. While the nation at large was observing Air Travel Week, one accessory manufacturer, Goodyear, was quietly celebrating its thirtieth anniversary as a producer of airplane tires.

Back in 1908 Goodyear made tires especially designed for airplanes. The company has gone ahead steadily in this work and now produces five different types of tires in 140 sizes, ranging from tiny tail wheels three inches in diameter to the giant casings used on planes of the "flying fortress" type and also handles tubes, wheels, and brakes.

Outstanding contributions by Goodyear to the aeronautic industry in recent years are the extra low-pressure Airwheels for airplanes and the multiple disk brake. The Airwheel completely revolutionized airplane tire design; its ability to smooth out landing shocks and withstand most severe side loads have made it standard equipment on many planes. The multiple disk brake (two series of disks contained inside the hub, operated by compressing one series against the other) provides far greater braking area than ordinary equipment and allows positive braking control. Goodyear also claims to have developed this country's first successful air brake for airplanes to provide power necessary to stop ships of the "flying fortress" type.

Farm Contest Winners

Ten bronzed, enthusiastic guests of the Goodyear company, winners of its national essay contest "Rubber Tires for Farm Tractors and Implements," enjoyed a North Woods vacation in September as part of their prize. Brought to Akron from the nine states in which they reside on August 19, they saw tractor tires made; met Goodyear executives at a luncheon at President P. W. Litchfield's residence; saw their first major league ball game, at Cleveland; took their first steamship ride, to Buffalo; visited Niagara Falls and Toronto; arrived at Mr. Litchfield's Timagami, Ont., lodge (more than 300 miles north of Toronto) on August 21. Then began a week of fishing, boating, canoeing with grizzled Indian guides, hiking through beautiful forests, ball games, and swimming. Bidding farewell to Mr. Litchfield, their host, on August 28, the boys began the homeward journey, their itinerary including a stopover at Callander to see the quintuplets; visit to Ottawa; tour of the

Finger Lakes district, en route to Akron from whence the train trips to their homes completed the circuit of their outing.

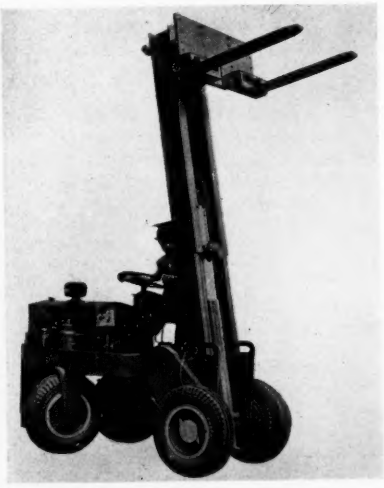
The winners were Jim Dismukes, Prattville, Ala.; Jewell Stone, McFarland, Calif.; George Murray, Hughesville, Pa.; Lloyd Ford, Yuma, Colo.; Carroll Coffman, German Valley, Ill.; Phil Baideme, Westfield, N. Y.; Frank Baldwin, Lapeer, Mich.; Jimmy Miles, El Campo, Tex.; Robert Paine, Yokena, Miss.; and Jack Gould, Sacramento, Calif.

Goodyear Movie for 8113 A.D.

Beneath the Administration Building of Oglethorpe University in Georgia is the "Crypt of Civilization," to be opened 6,175 years hence, which holds for posterity a record of our times, including customs, foods and drinks, sports, recreations, religions, health measures, music, means of transportation and communication, housing, etc. Among the motion pictures buried is a Goodyear film showing its various mills and factories, the growing of rubber and cotton, and their manufacture into tires, and the construction of air ships.

Burr to Retire

D. R. Burr, consulting manager of Goodyear's mechanical goods sales department, who has 44 years' service in the rubber industry retired on pension last month. His first experience, at 21, came with Kilborn & Jacobs, mill supply and mechanical goods jobber formerly of Columbus, beginning in 1894. This was followed by four years as an independent jobber of mechanicals. In 1905 Mr. Burr joined Diamond's Sales department and the next year was put in charge of western sales, headquartering at Chicago. In 1913 he went to Goodyear to take charge of the Chicago office for mechanical goods sales. Three years later he was transferred to Akron as assistant manager of the department. In 1918 and 1919 he was assigned temporarily to the Export Division to establish a sales setup for Goodyear mechanical goods products in Australia and New Zealand. Returning to Akron, he resumed his duties as assistant manager, but in 1920 became manager. Since 1933 he was consulting manager.



Howel Industrial Truck Equipment with General Tires

General Tire News

William O'Neil Returns from Europe

Upon his return on October 18 from a two months' business trip in Europe and London where he attended the last meeting of the International Rubber Regulation Committee, William O'Neil, president of the General Tire & Rubber Co., Akron, O., said that he found in London an inclination on the part of British and Dutch rubber producers to cooperate generally with the American manufacturers.

In an interview Mr. O'Neil said, "Not only are American manufacturers consuming more rubber than is being shipped in, but stocks of tires in manufacturers' hands have become depleted and must be replenished. The quota should be set at 55% for the first quarter of 1939. Unless more rubber is received, the price of crude is likely to soar dangerously. The British and Dutch want nine pence a pound for rubber, which America is willing to pay, but it fears that a too restricted output will put the price dangerously high."

Mr. O'Neil and A. L. Viles, president of the Rubber Manufacturers' Association, Inc., were the only American representatives at the meeting.

Mr. O'Neil paid a warm tribute to American-built airplanes as compared to European-made planes. Flying from Brussels to Berlin, he detected signs of structural weakness in the plane in which he and his party were flying. Three days later this plane went to pieces in the air, killing 20 persons, he said.

New Traveling Hoist

R. C. Howell, Cleveland engineer, recently perfected a new type of industrial truck said to be able to swing a load of three tons from a factory floor to a height of nearly 12 feet. This appliance, furthermore, can be driven right into a boxcar and can load up a height of six feet without utilizing the telescoping frames which nearly double the height to which it can hoist. Bearing the weight of both the pay-load and the truck are dead axles and the 12-ply heavy-duty General industrial truck tires with Retainair tubes.

Ohio State University, Columbus, has added a new curriculum in its college of engineering leading to a degree in welding engineering.

Lima Cord Sole & Heel Co., Lima O., has announced that Alfred A. Curtis, vice president and general manager since August 1, has been elected president, succeeding F. L. Maire, deceased.

Firestone Activities

The Firestone Tire & Rubber Co., Akron, on October 5 filed with the Securities & Exchange Commission a registration statement for an issue of $50,000,000 ten-year 3½% debentures due October 1, 1948. The proceeds received therefrom will go in part toward retiring $5,555,000 of the 15-year 5% bonds of Firestone Tire &Rubber Co. of California, called for redemption September 1, 1942, and $7,272,000 of 20-year 3% sinking-fund bonds of Firestone Cotton Mills, due March 1, 1948. The balance of the proceeds will be used to retire all bank loans.

A fixed sinking fund will be organized starting on August 25, 1939, to retire $1,500,000 of the debentures annually. Besides an earnings sinking fund will be maintained into which Firestone will pay the trustee on each February 23, starting in 1940, a sum equal to 20% of the consolidated net income of the company for the fiscal year immediately preceding the date of such payment, or sufficient to retire $1,200,000 of the debentures yearly, whichever is the smaller amount.

In five years Firestone has added seven plants to its properties. Their depreciated value, as of July 31, was $17,546,475; while the total fixed assets were listed at $74,929,991 after depreciation charges.

Liberia Company

Firestone Plantations Co., a subsidiary, in its concession in Liberia now has planted more than 65,000 acres of rubber trees; of these 18,000 acres have matured and are producing rubber. Liberia is not a party to the international rubber regulation agreement.

Winners Ride on Firestone Tires

Among the 29 competitors at the sixty-first annual National Plowing Match held recently in Wheatland, Ill., 19 included Firestone tires in their equipment. Members of this group won 90% of the first and second place honors in all classes of competition. Paul Stiefbold, the new 1938 Plowing Champion of America, like every other plowman who placed in the first four prize-money positions, had his tractor equipped with Firestone Ground Grip tires. In the plowing exhibition for boys from 14 to 18 years old and the one for boys from 18 to 21 both first place winners and both runners-up all won on the Ground Grip rubber tire equipment.

Despite the first victory of mechanical power plowing in 1912, the horse-drawn unit continued to compete with a measure of success until the advent of the rubber tractor tire. Following the introduction of Firestone's early Ground Grip tires, steel also was practically eliminated from the competitive picture. This year only two tractors with steel wheel equipment were entered; one finished last, the other next to last in their respective classes.

The judges compile the individual scores on the following basis: opening furrows, 25 points; conformation of

furrows, 25 points; straightness of furrows, 25 points; evenness of furrows, 15 points; general neatness, 10 points. So exacting is judging procedure that every furrow in the ¾-acre plot must be examined with minute care. Even shadows from the sun are taken into consideration in evaluating the conformation and uniformity of the furrows, as the judges go about the four-hour job of determining the winners.

Fair Building Dedicated

On October 19 Mayor F. LaGuardia of New York dedicated the Firestone building at the World's Fair grounds in the presence of Harvey S. Firestone, Jr., vice president of the company, who declared that he believed this exhibit would give visitors a broad picture of the rubber industry and enable them to gain a new conception of what it has contributed today and proposes to give tomorrow.

Goodrich News

Increased demand for white sidewall tires at the rate of approximately 25% annually is noted by The B. F. Goodrich Co., Akron.

Recent introduction of a new Goodrich passenger car tire has been accompanied by a new technique in tire sales, according to C. B. O'Connor, general tire sales manager. This new method is the demonstration and sale of the new tire on rainy days, reversing the ordinary procedure used in the industry, and going back for many years. Throughout the country, therefore, on days when the streets are wet, Goodrich dealers are being trained to call on their potential customers and suggest a demonstration of the new tire's non-skid qualities.

The President's Safety Trophy recently was presented by Vice President T. G. Graham to the Philadelphia plant, represented by G. F. Lane, production superintendent, at a safety rally there. The plant won six months' possession of the trophy with its record for the first half of 1938.

S.C.I. Medalist

(*Continued from page 52*)

lace P. Cohoe presiding, at the Chemists' Club, 42 E. 41st St., New York. The medal is awarded annually for valuable application of chemical research to industry; Dr. Dorr receives it in recognition of his inventions and subsequent world-wide introduction of apparatus and processes in many chemical, metallurgical, and sanitational operations. Dr. Dorr will present a paper entitled "The Influence of the Laws Relating to Research and Invention on Human Progress;" and Howard C. Parmalee, of McGraw-Hill Publishing Co., 330 W. 42nd St., New York, will speak on the life and accomplishments of the medalist.

NEW ENGLAND

DURING the last several weeks New England has devoted itself to rehabilitation after the first hurricane ever recorded in this section, which resulted in several hundred deaths and a property loss of many millions of dollars. Despite the havoc of "the big blow" business activity in New England continues upward. Gains are listed for the building industry in a contra-seasonal trend, wool goods mills, cotton mill operations, and shoe production. New England produces about 40% of the rayon fabrics and blends of the whole nation, besides 35% of the country's footwear. Shoe production in this section for the first eight months of 1938 was 10% less than for the corresponding period last year, against 17% for the entire industry. Unemployment has dropped, partly, however, owing to the work necessary after the storm.

According to Narrow Fabrics Institute, woven elastic manufacturers can anticipate for the balance of this year a 10 to 15% additional gain in business activity. There are 32 woven elastic factories in the country, and 24 are in New England. These have decided to increase business beyond the noticeable improvement of the last few months by emphasizing the possibilities of woven elastic fabrics in new and old uses. Recent trends in women's fashions have aided this upswing, and even men's wear has adopted the advantages of these fabrics. Thus with the increased volume a corresponding rise can be expected in the earnings of the 3,085 workers in the industry in New England.

Fisk Reports

Prospects for sales of tire accessories and repair materials during the next six months are exceptionally bright, according to H. W. Brown, sundry sales manager, the Fisk Rubber Corp., Chicopee Falls, Mass. Bicycle tire and tube sales to the trade were better than anticipated through the first half of 1938, and the last half is expected to be even better, compared with last year. Mr. Brown anticipates greatest sales of bicycles will come within the next few years and that the largest proportionate increase will be in sales to adults, who have taken up the bike for pleasure and health.

Safety Precaution

Lives are lost and many injuries suffered annually in the United States from lack of caution in mounting or dismounting a tire, warned R. A. Gray, service manager of the Fisk Tire Co.

"Loss of limbs and even decapitation have resulted from failure to make certain rim rings are locked properly. As pressure is applied to a newly mounted tire, the insecure ring flies loose with the force of dynamite. The worker is bending over with an air pump in hand, usually in such a position that he cannot avoid being hit," Mr. Gray said.

The same danger exists when dismounting a tire. Common practice is to roll it across a garage floor and drop it on its side. The softened tire has released the locking arrangement, but occasionally enough pressure remains to hurl the ring through the air with disastrous results.

"Making certain that all parts are tightly fitted when mounting, and releasing all air before dropping a tire to be dismounted will completely eliminate this type of accident," Mr. Gray added.

Tube Repair Kit Sales

More tube repair kits than there are motorists are sold yearly in the United States even though not many drivers are seen repairing flats along the highways. H. W. Brown, Fisk sundry sales manager, explains that the repair kit has been graduated from the garage to the home and the business office. Converted to household use, the kit will repair ice and hot water bags, shower caps and curtains, and other flexible rubber articles. The cold patching cement, in the office, replaces glue, mucilage, and paste.

Davol Rubber Co., Providence, R. I. Ernest I. Kilcup, president and executive manager, and Leon N. Nodine, plant manager, were members of the Industrial Division for the annual Providence Community Fund campaign.

Carr Mfg. Co. has awarded a contract for the construction of a one-story wood and brick addition, 70 by 23 feet, to its plant at Franklin and Buttonwood Sts., Bristol, R. I.

Associated Industries of Massachusetts held its twenty-third annual meeting at Copley Plaza, Boston, on October 20. Among the scheduled list of speakers were: Lammot du Pont, president, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; Cyrus S. Ching, director, industrial and public relations, United States Rubber Products, Inc., 1790 Broadway, New York, N. Y.; Donald M. Nelson, vice president, Sears Roebuck & Co., Chicago, Ill.; J. Edward Doyle, supervisor of personnel, General Electric Co., Schenectady, N. Y.; and Claude L. Peake, manager of industrial relations, du Pont. Mr. Ching's address was on "Management's 1938 Problem."

R. I. Rubber Club

(*Continued from page 52*)

Inc., announced that a course of 16 lectures on rubber chemistry would be given at Massachusetts Institute of Technology, Cambridge, Mass. Two of these will be given by Dr. Ernst A. Hauser of M.I.T. The fee will be $5 for 8 lectures or $8 for 16. No details were available as to the time and nature of the lectures.

MIDWEST

BARRING labor trouble, October is expected to be the best automobile production month of 1938 after September showed a slow start on new models. One week last month, for the first time since early May, automobile production went over the 50,000 mark. Dealers orders for new cars are exceeding expectations; while the used-car problem, in sharp contrast to last fall, will be virtually non-existent. Better automobile sales are being reported; and production is up also for automobile accessories.

The announcement on October 18 by General Motors that it would reemploy 35,000 workers within the next fortnight and rescind last February's 10 to 30% salary cuts had a heartening effect all over the country as the benefits from this plan are manifold, including a big dent in the relief load and increased purchasing power.

Next came an announcement from Chrysler that it had taken on 34,000 men since August 1 and was still hiring workers. Production also has been stepped up 20%, and certain salary reductions of March 16 would be restored October 31.

Safety Congress

National Safety Council, 20 N. Wacker Dr., Chicago, Ill., held its Silver Jubilee Safety Congress and Exposition at the Stevens Hotel, Chicago, October 10 to 14, attended by more than 10,000 delegates from all over the world.

The Rubber Section announced the election of the following officers for 1938-1939:

General chairman, R. A. Bullock, Corduroy Rubber Co., Grand Rapids, Mich.; vice chairman in charge of program, R. W. Morse, Firestone Tire & Rubber Co., Akron, O.; secretary, Oliver Hopkins, United States Rubber Products, Inc., Providence, R. I.; *News Letter* editor, C. W. Ufford, Ohio Rubber Co., Willoughby, O.; engineering committee chairman, Ralph S. Farnum, U. S. Rubber Products, Detroit, Mich.; health committee, Dr. W. S. Ash, U. S. Rubber, Detroit; Dr. P. A. Davis, Goodyear Tire & Rubber Co., Akron; Dr. J. Newton Shirley, Arrow Mutual Liability Insurance Co., Watertown, Mass.; membership committee chairman, R. M. Weimer, Dayton Rubber Mfg. Co., Dayton, O.; publicity committee chairman, John L. Grider, American Hard Rubber Co., Butler, N. J.; statistics committee chairman, Roland Kastell, U. S. Rubber Products, New York, N. Y.; members at large, John J. Loge, General Tire & Rubber Co., Akron, J. E. Lovas, U. S. Rubber Products, Passaic, N. J., W. H. MacKay, Dunlop Tire & Rubber Corp., Buffalo, N. Y., Urban L. Moler, Inland Div., General Motors Corp., Dayton, William Spanton, American Hard Rubber, Akron, Paul Van Cleef, Van Cleef Brothers, Chicago, D. G. Welch, Hewitt Rubber Corp., Buffalo.

"Wind-up" Accident Hazards

To a worker in the rubber industry a "wind-up accident" usually means the loss of an arm or a leg, or, all too frequently, a life. This hazard of the wind-up operation in rubber was the subject of an address delivered October 10 before the Rubber Section by Mr. Farnum, safety supervisor of U. S. Rubber Products, Detroit.

Six cardinal points to be considered in combating the hazard were listed by the speaker, including careful selection of the right type of workman for the job; complete instructions and coaching by the foreman; insistence on standard procedure; efforts to instill safety consciousness into the workmen; careful inspection to avert mechanical failure, and the installation of proper safeguards.

Said Mr. Farnum:

"Wherever there is a wind-up, whether it be on a calender or on a web fabric solutioning machine, it is always excellent safe practice to install a treadle the width of the machine, wherever the employe might stand, so that if both hands are caught in a wind-up, he can stop the roll by stepping on a treadle connected to a motor cut-out switch.

"Push-button cut-outs are sufficient if one hand only is caught, but, since we are never able to order our accidents, it is best to prepare for the worst condition.

"Do not let an employe wear gloves, dangling sleeves, a necktie or any other type of loose clothing which could get caught.

"Don't crowd your calender helpers so they take short cuts. Keeping up production is, of course, very desirable, but keeping our limbs is very much more important.

"One serious accident happened in the rubber industry, resulting in the loss of a hand because of taking a short cut. While one roll was being wound on a double wind-up, the second spare shell was to be put in between the centers, the liner folded around the shell to be ready for use. At this point the helper twirled the hand wheel to put a small amount of tension on the shell centers and folded the liner over the shell. As he tucked it in, his hand was caught in the bite and resulted in amputation. The other helper was a short distance away, picking up another roll to try to speed things along.

"That is an illustration of an experienced man on the job having what is known as a mental failure. He knew better, but he didn't think. Mental failures are the cause of a great many accidents and, whether we like it or not, it is the truth. When we can prevent mental failures or lapses, we have done considerable toward elimination of accidents."

The Brown Rubber Co., Lafayette, Ind., according to President Robert Mitchell, has acquired a controlling interest in Composite Materials Corp., Detroit, Mich., manufacturer of a patented rubber based, sound deadening material to be sprayed on the interior metal panels of automobiles.

Dryden Rubber Co., 1014 So. Kildare Ave., Chicago, Ill., through President George B. Dryden has announced that Gordon Stanley ("Mickey") Cochrane, former manager of the Detroit American League baseball club, has joined the rubber company as special representative in the Detroit area. The concern manufactures molded and extruded rubber goods, hard rubber, sponge rubber, friction tape, soles, and heels. The Detroit office is at 2-270 General Motors Bldg.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., Canada, according to a recent statement by President A. G. Partridge, had earnings for the first three quarters of the current fiscal year that compared quite satisfactorily with the corresponding period of 1937. Current sales volume, however, was less than for last year because of present general business conditions, but Mr. Partridge expects that with signs of improvement noted and with the automobile industry producing 1939 models the sales volume for the last quarter of this year should keep up very well.

Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont., has consummated its plan for reconstruction of its capital structure, decided upon at a special stockholders' meeting on July 8. Details of the plan follow: cancellation of the existing authorized and outstanding 5,000 7% cumulative preferred shares, par $100, and of all accrued dividends on this stock, whether declared or not; preferred shareholders to receive three shares of the company's common stock for each share of preferred surrendered, the shares to be contributed from the common stock held and owned by the Seiberling Rubber Co., Akron, O. The capital structure of the Canadian concern before the acceptance of the plan was: 31,315 shares of common stock, $626,300, plus 5,000 shares of preferred, $500,000, totaling $1,126,300; the capital structure now is 31,315 shares common, $626,300, of which 20,758 shares are owned by the Ohio company.

FINANCIAL

Unless otherwise stated, the results of operations of the following companies are after deductions for operating expenses, normal federal income taxes, depreciation, and other charges, but before provision for federal surtax on undistributed earnings. Most of the figures are subject to final adjustments.

Boston Woven Hose & Rubber Co., Cambridge, Mass. Year ended August 31, 1938: gross income, $36,873.54; loss, $202,151.56, after allowing $208,598.68 for depreciation on plant and machinery and providing for all other charges. Merchandise sales for the year decreased $1,939,001.06, or 28.8%.

Dow Chemical Co., Midland, Mich. Quarter ended August 31: net profit, $838,703, equal after preferred dividends to 81¢ each on 945,000 common shares, against $1.42 a share for the corresponding quarter last year.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Nine months ended September 30: earnings of $2.31 each on 11,042,003 shares of common stock, against $5.33 a share for the corresponding period last year. Indicated earnings in the third quarter were 95¢ a share on the common stock, against 71¢ in the second quarter and $1.92 in the third quarter of 1937.

Electric Hose & Rubber Co., Wilmington, Del. Year ended August 31: net loss, $16,755, against net income in the preceding year of $105,628, equal to $8.29 each on 12,741 capital shares.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Dayton Rubber Mfg. Co.	Com.	$0.50 resumed	Oct. 27	Oct. 17
Dayton Rubber Mfg. Co.	Class A Pfd.	$1.00 semi-annual	Oct. 27	Oct. 17
De Vilbiss Co.	Com.	$0.25 irregular	Oct. 15	Sept. 30
De Vilbiss Co.	($10) 7% Pfd.	$0.17½ q.	Oct. 15	Sept. 30
Dow Chemical Co.	Com.	$0.75	Nov. 15	Nov. 1
Dow Chemical Co.	Pfd.	$1.25 q.	Nov. 15	Nov. 1
Fisk Rubber Corp.	Pfd.	$1.50 q.	Oct. 20	Oct. 10
Goodyear Tire & Rubber Co.	Pfd.	$1.25 q.	Dec. 15	Nov. 15
Hercules Powder Co.	Pfd.	$1.50 q.	Nov. 15	Nov. 4
Lee Rubber & Tire Co.	Com.	$2.00 final	Oct. 26	Oct. 15
Mid-West Rubber Reclaiming Co.	Com.	$0.25	Oct. 5	Sept. 24
Pharis Tire & Rubber Co.	Com.	$0.15 q.	Oct. 25	Oct. 10
Pharis Tire & Rubber Co.	Com.	$0.15 extra	Oct. 25	Oct. 10
U. S. Rubber Reclaim Co.	8% pr. Pfd.	$0.50	Oct. 25	Oct. 21

Subdivision of Gross Income

It is interesting to consider the proportionate disbursements of industrial companies, particularly as regards wages and salaries, taxes, employe benefits, and the combined dividends and reserve.

During the nine-year period 1929 to 1937 inclusive, the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., had a total gross income of $1,261,313,000, of which it distributed 46.7% as wages and salaries to employes in comparison with 18.97% disbursed for the same purpose by all manufacturers in the United States during the seven-year period 1929 to 1935 (figures for 1936 and 1937 are not available).

Details of the Westinghouse statement of operations 1929 to 1937 inclusive, as recently distributed by A. W. Robertson, chairman of the board in a leaflet entitled "The Story of 9 Years and a Billion and a Quarter Dollars" are given below.

Income	$	%	
1. During this nine-year period we received from our customers for Westinghouse products which they purchased from us..	$1,234,461,000		
2. And from our investments (dividends, interest, etc.).....	26,852,000		
3. WHICH GAVE US A TOTAL INCOME OF.....	1,261,313,000	100.0	100.0
Disbursements			
4. We paid out for materials, supplies, fuel, transportation, and other expenses	491,112,000	38.9	
5. We set aside to replace plants and equipment as they wear out	58,036,000	4.6	
6. And paid in interest on borrowed money.....	383,000		
7. While government tax collectors (federal, state, local, and foreign) required	42,292,000	3.4	
8. These disbursements (items 4 to 7 inclusive) amounted to..	591,823,000		46.9
9. WHICH LEFT FOR OUR EMPLOYES, FOR OUR STOCKHOLDERS, AND FOR FUTURE NEEDS.....	669,490,000		53.1
10. Of the amount shown in item 9, our employes received in wages and salaries	589,091,000	46.7	
11. And group insurance premiums and payments to the employe annuity fund amounted to	15,253,000	1.2	
12. Which left net earnings, available for stockholders and for future needs, amounting to.....	65,146,000	5.2	

"Of further interest," concludes the statement, "are the figures published by the United States Treasury Department for all manufacturing companies in the United States for the period 1929 to 1935 (the figures for 1936 and 1937 have not yet been completed)."

The figures follow:

ALL MANUFACTURING COMPANIES IN THE U. S.

Total Income (Corresponding to Line 3).....	$330,709,960,000	
Employes' Salaries and Wages (Corresponding to Line 10).....	62,743,726,000	18.97%
Net Earnings (Corresponding to Line 12).....	7,348,668,000	2.22%

General Cable Corp., 420 Lexington Ave., New York, N. Y. September quarter: net loss, $288,097, against loss of $260,083 in the preceding quarter and a profit in the third quarter of 1937, totaling $919,999, equal after dividend requirements on 7% preferred and Class A stocks to 52¢ each on 550,730 shares of no-par common stock. Nine months to September 30: net loss, $614,327, contrasted with net profit last year of $2,876,575, or $1.78 a share, on common.

General Electric Co., Schenectady, N. Y. First nine months of 1938: sales billed, $192,501,173, against $260,773,533 during the 1937 period; net income from sales $11,908,043, against $31,959,599 in the nine months ended September 30, 1937; orders received, $188,756,958, against $305,276,556, for the same period last year; profit available for dividends on common stock, $17,548,256, equivalent to 61¢ a share, against $39,663,931 for the first nine months of 1937, equal to $1.38 a share.

Hercules Powder Co., Wilmington, Del. Nine months to September 30: net profit, $1,968,635, equal, after preferred dividend payments, to $1.20 each on an average of 1,316,710 common shares outstanding during the period. Net profit last year was $4,283,823, or $6.57 a share, on an average of 592,527 common shares then outstanding. September quarter: net profit, $741,501, equal to 46¢ each on 1,316,710 average common shares, against $571,107, or 33¢ a share, on 1,316,710 average common shares in the preceding quarter and $1,246,811, or $1.87 a share, on 596,180 average common shares in corresponding period last year.

Hewitt Rubber Corp., Buffalo, N. Y. Nine months ended September 30: net earnings, $53,911, equal to 32¢ a share on outstanding capital stock. Of this amount, $32,124, or 19¢ a share, was earned in the September quarter. Earnings in the first nine months of 1937 were $260,968, or $1.55 each on 168,188 shares; for third quarter of that year earnings equaled 36¢ a share.

Rubber Industry in Europe

GREAT BRITAIN

Revised Regulations for I.R.I. Diplomas

The following excerpts from an announcement from B. D. Porritt, chairman, examination board, I.R.I., indicate the objectives of the revision in the regulations for diploma membership in the Institution of the Rubber Industry.

"As the result of careful consideration by the Examinations Board of the I.R.I., revised regulations for the Institution's Diplomas have been prepared and will come into force on January 1, 1939. . . .

"The scope of the examination for the Associateship has been widened so as to insure that successful candidates possess not only a specialized knowledge of the particular branch (General Technology, Science, or Engineering) which they select, but also a sound general knowledge of the science and technology of rubber as a whole. In keeping with this change, the division of the Diploma, as distinct from the examination, into the three classes, General Technology, Science, and Engineering, has been abandoned. . . .

"The Examinations Board has taken the view that candidates specializing in the science or engineering branches should obtain a recognized qualification in general science or engineering at a university or through the appropriate professional institution. . . .

"In revising the regulations for admission to the Fellowship, the view has been taken that passage from the Associateship to the Fellowship should not be more or less automatic after the lapse of a certain number of years, but should be confined to candidates of outstanding merit. To this end there has been introduced a Fellowship examination somewhat on the lines of the higher university degrees, the most important part being a thesis on some approved subject. It is thus intended that the award of the institution's highest diploma—the Fellowship—will be a recognition of exceptional qualifications and the performance of some service of real merit to the rubber industry."

Members of the institution may apply for the Associateship Examination under the old regulations if their applications are received by the Secretary on or before December 31, 1938.

Copies of the revised regulations will be sent on application to W. F. V. Cox, secretary, Institution of the Rubber Industry, 12 Whitehall, London, S.W. 1, England.

I.R.I. Meetings

The following is a list of papers scheduled for I.R.I. meetings during October, 1938:

October 10, Midland. "Influence on Final Product of Fast and Slow Vulcanizing Rubbers," M. M. Heywood.

October 10, London. "Compounding Ingredients for Latex," Dr. C. F. Flint.

October 12, Brantford-on-Avon. "Processing and Applications for Synthetic Rubber," J. G. Anderson.

October 18, Edinburgh. "Recent Industrial Developments in Scotland," C. A. Oakley.

October 20, Leicester. "The Past, Present, and Future of Synthetic Rubber," Dr. W. J. S. Naunton.

New Goods

Among the novelties at the Shoe and Leather Fair held early in October were the Fleetfoot "Vent" sport shoes which have special air ducts running from side to side through a cork mid-sole so that the shoe is automatically ventilated at each step, displayed by the Dominion Rubber Co., which also showed children's sandals each having the picture of one of Walt Disney's Seven Dwarfs. The sandals come in five colors, white, blue, yellow, pink and green.

A rubber riding boot, selling at 25s. per pair, was an attraction at the stand of Gutta Percha & Rubber (London) Ltd. "Perkey Pads," displayed by the same firm, have vulcanized crepe-rubber soles, name tabs, and a cotton-covered vulcanized rubber gusset front instead of laces or other closing.

The Reliance Rubber Co. recently marketed two new hot water bottles. One has a rubber-lined peach-colored velour cover which has a flap closing by means of snap fasteners. The other bottle has white figures inlaid in Wedgwood blue rubber.

Rubber Pavings

The Mersey Tunnel Joint Committee has been taking up the question of skidding in Queensway, says the *Liverpool Post*, and a report on the behavior of vehicles on various types of tunnel surface is expected shortly.

Rubber paving laid over the Mersey railway to prevent vibration does not appear to have been entirely satisfactory. Part of it was removed and replaced by metal setts; according to the report of experts, this substitution did not lead to any increase in vibration, but what is more, skidding at that spot decreased. Consequently the committee decided to have the rest of the rubber paving taken up and to substitute metal studs.

It is further learned that the proposal to pave Albert Square, Manchester, with rubber setts has been postponed because the Transport Committee has decided to convert the Manchester street car system to Motor-bus and trolley-bus services within three years. However the work of paving with rubber the section of Mount St. running along the Town Hall extension, is going forward.

Troops on Rubber Soles

When at dawn October 19 nearly 1,000 British Coldstream Guards marched into the Old City of Jerusalem and delivered the district from the hands of Arab rebels, the troops wore rubber-soled shoes for sure footing on the ancient cobbled streets.

GERMANY

The Aktiplasts

A series of new compounding ingredients, known as the Aktiplasts, recently was put on the market by a German firm. According to Dr. F. Kirchhof,[1] the Aktiplasts not only facilitate extrusion and calendering of crude and Buna rubber mixes, but also confer such good properties that the rubber or Buna content can be cut 10 to 15% and the mixes will still show the same or even better qualities than mixes without the Aktiplasts. Up to 25% of Aktiplast, calculated on the weight of rubber, may be advantageously incorporated in compounds.

The Aktiplasts are solid, yellow-brown to dark brown products of a soft to hard waxy consistency. Their melting points range from about 40 to 80° C., according to quality; they are easily mixed with crude, synthetic or reclaimed rubber, in which they are largely soluble. Because of their excellent dispersing effect, they permit a saving of up to 10% of other dispersing agents, and as they contain 10 to 15% (calculated on their own weight) of organically combined zinc oxide, activators like zinc oxide or stearate may be omitted when they are used. The addition of Aktiplasts to compounds, it is claimed, increases the tensile and elongation values at optimum cures

[1] *Gummi-Ztg.*, Sept. 23, 1938, p. 993.

from 10 to 20% as compared with ordinary vulcanizates.

The Aktiplasts are available in three qualities:

Aktiplast A, dark brown, soft, particularly suitable as dispersion and plasticizing agent in Buna S and Buna S—carbon black mixes, together with Kautschol as softener.

Aktiplast R, light brown, resembles and smells like bees wax; melting point about 40 to 45° C.; good dispersing agent for rubber and Buna mixes; at the same time acts as reenforcer; and also gives excellent aging qualities.

Aktiplast T, yellow-brown, resembles hard wax, melting point 70 to 75° C.; is advantageously incorporated in a melted state; because of its light color, is particularly useful in white or pale tinted compounds.

These Aktiplasts are for the most part manufactured from natural products obtainable in Germany, but an Aktiplast is also being developed on entirely synthetic bases. This type will not become available to consumers until one of the components has been produced on an industrial scale, which it has not been found possible to do as yet.

All the Aktiplasts are neutral and can be used with all the usual rubber fillers and ingredients. As the Aktiplasts bind a certain amount of sulphur during vulcanization, a somewhat higher proportion of sulphur must be used than is customary in ordinary mixes. Thus for every five parts of Aktiplast added to 100 parts of rubber or Buna the sulphur must be increased by 0.1%.

Rubber Goods Exports

The chief German exports of rubber manufactures declined during the first half of 1938 as compared with the same period of 1937. Automobile tires fell from 144,658 to 92,211 units, chiefly owing to considerably reduced purchases by Great Britain, British India, and the Netherlands. Shipments to some of the smaller European countries as well as to some South American states were also lower; on the other hand there were comparatively large gains in trade with Netherland India, British Malaya, Siam, and German East and South West Africa. Footwear exports decreased from 133,864 to 125,615 pairs; packing from 1,186 to 1,080 quintals; other soft rubber goods from 35,649 to 31,597 quintals; elastic goods and rubber and fabric goods from 10,365 to 10,389 quintals; hard rubber (unvulcanized) rose from 594 to 795 quintals, but hard rubber manufactures declined from 5,505 to 4,408 quintals.

Company News

The New York Hamburger Gummiwaaren Co., Hamburg, has raised its capital to 3,200,000 marks.

The Harburger Gummiwarenfabrik Phoenix A.G., Hamburg-Harburg, has adopted a new constitution. The directors have been empowered to increase the capital by 1,620,000 marks before December 31, 1942.

The Veritas Gummiwerke A.G., reports net profits of 25,546 marks for 1937. With the carry-forward from the preceding year, a total of 35,714 marks was available, and a dividend of 4% (against 6%) was paid. The company has gone to considerable expense to improve its plant; the costs of raw materials as well as semi-finished and finished products rose considerably during the year under review. It was also stated that a larger sum had to be written off for machinery because of the greater strain on them due partly to higher output and partly to increased use of synthetic materials.

U. S. S. R.

To the end of 1932 Russian requirements of gutta percha were entirely covered by foreign imports, but in that year the intensive search for native sources of gutta percha finally gave positive results. Of the numerous plants investigated Eikomia and Beresklet appear most interesting. From Beresklet, a bush that grows comparatively freely, it is thought enough gutta percha may eventually be obtained to satisfy practically all Russian needs. According to *Kautschuk i Resina*,[1] the gutta percha obtained from Beresklet looks like grayish woody material. X-ray tests are said to have revealed much similarity between this gutta and the genuine tropical gutta percha. When fresh, Beresklet gutta has a resin content of only 8.4 to 9.2%, an indication of high quality; while the gutta content ranges from 63.76 to 90.86%. This material, however, is very variable, and depending on the time and method of storage, shows considerable changes in resin and also gutta content. Thus a sample of gutta, which, when fresh, had a resin content of 8.75%, was stored under room conditions and after 10 months had a resin content of 50.2% and after four years, of 85%, when it had become a brittle and easily friable white mass. The task now before Russian investigators is to find suitable stabilizers to prevent these effects of aging.

In the rubber-bearing plant Tau-Saghiz, cultivated in Russia, the rubber seems to be in the roots, and hitherto it appears to have been the custom to dig up the roots to extract the rubber, thus destroying the plantation. The Russian Rubber Trust reports that during 1936-1937 a new and much more efficient method was developed for exploiting these plants by which the plantation is saved and higher yields of a better grade of rubber are obtained. This method consists in "milking" the plants. During the quiescent period of the plant when the leaves are withered and dry, an incision is made in the root at the collar. The latex flowing out coagulates at the cut, forming a lump, and when the lump is removed, the flow and the coagulation of the latex are renewed. Milking can be repeated eight to ten times in a season, and the indications are that this process can be carried out over a period of years. By the new method a plantation of 110,000 four-year-old plants in 1936 and 1937 gave 309 kilos of rubber and will yield more in the future; whereas by the former procedure only 173.5 kilos would have been obtained at the cost of the destruction of the plantation. At present milking is done by hand, and the cost of producing a ton of rubber is given as roughly 15,000 to 16,000 rubels. Investigators are now considering the problem of finding a method by which the process can be completely mechanized.

[1] July, 1938, pp. 32-35.

FRANCE

Le Caoutchouc S.I.T., Paris, recently was formed to manufacture all kinds of rubber and gutta percha goods. The capital has been fixed at 14,000,000 francs, in shares of 1,000 francs each, of which 12,100 are held by Cie. Generale d'Electricite, Paris.

Michelin & Cie. at an extraordinary meeting decided to appoint two directors, Robert Puiseux and Pierre Boulanger, to manage the concern in addition to Edouard Michelin, hitherto sole director. The statutes of the concern have been altered so as to provide that if for any cause whatsoever Mr. Michelin should cease to act as director, the style and the signature of the concern are to read Puiseux, Boulanger & Cie., while the company would further be known as Manufacture de Caoutchouc Michelin.

Societe Nord-Africaine pour l'Utilization des Produits Rubtex et Guttaterna has been formed to sell in Algiers, Portugal, and later on in other countries the products known as Guttaterna or Rubtex. While most of the directors are of Paris, headquarters of the firm will be at Oudjda, Morocco.

Synthetic Rubber Progress

Belgium

That Russia and Germany have developed useful synthetic rubbers is sufficiently well known, but that a material similar to "Thiokol" has been produced in Belgium for the last six years or so will be news to many. This product, known as Ethanite,[1] is manufactured by the Sté. Ame Ethanite in its factory at Wondelghem, for British interests, it would appear. According to R. Pennescu in an article on synthetic rubbers,[2] the daily output at

(*Continued on page* 68)

[1] India Rubber World, Feb. 1, 1933, p. 45.
[2] *Caoutchouc et Plastiques*, June, 1938, pp. 26-30.

Rubber Industry in Far East

MALAYA

Latex Research

The Chemical Division of the Rubber Research Institute of Malaya continued its valuable research work in connection with the various problems relating to latex, according to the annual report for 1937. Further development of work on the constituents of latex has been concerned chiefly with the oxidation products of one of these constituents, caoutchene, and interesting materials have been obtained which give promise of containing oxygen in stoichiometric proportions with reference to a C_{30} unit. Existing work[1] on this subject has not yielded products of definite composition. The work now in progress involves the use of a new reagent. Analytical description of the new products is in hand.

Suitable modification of one of the above oxidative treatments of caoutchene yields a material which, while retaining a measure of elasticity, is very sparingly soluble in the usual rubber solvents. It is hoped in the near future to prepare this material in sufficiently large quantities for vulcanization tests.

X-Ray Studies

Recently equipment became available for X-ray studies, and despite initial difficulties numerous photographs have been made. Air-dried sheet, latex films, and the newly isolated substances, caoutchene and caoutchol, has been examined at various extensions, and certain new features established. Much fine measurement and calculation are necessary before final conclusions can be drawn, and it is not proposed to publish any results until a large amount of data has been obtained.

Putrefactive Odor of Latex

Studies on the putrefactive odor of preserved latex, recommenced toward the close of the year, are expected to yield extremely informative data on causes and prevention.

It is stated that one large latex exporter, who on the advice of the institute, used ammonia during collection and a powerful tar-acid disinfectant on large bulking tanks, factory utensils, and on the factory building itself, for over three years, had not a single complaint of putrefactive odor in that time. It is held certain that these precautions prevented the establishment of ammonia-resistant strains of bacteria. Other latex exporters who did not adopt this procedure from the start, it is added, began to find themselves in difficulties after about one year's working.

[1] Mair and Todd, *J. Chem. Soc.*, 1932, 386 (1932); Bloomfield and Farmer, *J. Soc. Chem. Indr.*, 126T (1935).

Concentration by Centrifuging, Evaporation, and Filtration

Experiments were carried out in concentrating latex by centrifuging, particularly with a view to preparing special purified concentrates. A number of trials were made to study the effect of repeated dilution and reconcentration on the composition of the concentrate. At every stage tests were made for D.R.C., total solids, acetone extract, acid-value, viscosity, surface tension, stability and nitrogen content, and results are to be published shortly. In one trial it was found possible to dilute and reconcentrate no fewer than 27 times before clotting commenced. Incidentally, even by this very exhaustive washing the rubber from the final concentrate was not entirely freed from nitrogen.

In the second quarter of the year work was commenced again with a small evaporator designed by the scientific officers of the London Advisory Committee. The machine was found unsuitable for use on estates, but the evaporated cream produced is a valuable form of concentrate having a very high dry-rubber content without at the same time a high proportion of non-rubber constituents. It is considered that if more efficient machines are perfected, this type of concentrate will find markets.

Promising results have also been obtained with concentration by means of filtration, and further experiments are to be conducted along this line.

Softened Rubber

During the year experiments were made on the incorporation of "peptizing agents" into latex with a view to obtaining a soft rubber as a result of the effect of the heat applied during smoking. In the early trials phenylhydrazine hydrochloride solution was applied shortly before the acid, and the resulting rubber was machined and dried in the ordinary way. Although the rubbers obtained were encouragingly soft, the toxic nature of the softening agent bars its use on estates.

By courtesy of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U. S. A., a small supply of a non-toxic "peptizing agent" was procured. Because the material is insoluble in water, though soluble in acetone (which is itself a coagulant for latex) the problem of uniform incorporation into latex had first to be solved, after which, however, uniformly soft rubbers were obtained which encourage the view that the process has commercial possibilities. Unlike other processes for the preparation of soft rubber it would not involve estates in the installation of large and expensive plant; one small machine only would be required costing about £40, while existing estate equipment would be employed for all other operations.

When further supplies of the peptizing agents are received, trial batches will be prepared for manufacturers' tests.

INDIA AND BURMA

At the end of 1936, India and Burma were reported to have a total of 15,508 rubber plantations and small holdings covering 324,693 acres; of this 228,168 were planted to rubber, 202,497 acres being in tapping. Of the total area under cultivation 41% was in Burma, 43% in the state of Travancore, and the rest in Madras, Cochin, Coorg, and Mysore, all of which (including Travancore) are in South India. The yield per acre is highest in Burma, 354 pounds per acre; Travancore harvests only 252 pounds per acre, Cochin 317, and Madras 253.

Travancore, by the way, has a rubber factory, the Travancore Cables & Rubbers Ltd., at Trivendrum, which in 1937 used 65 tons of rubber.

CEYLON

In accordance with the proposal of the International Rubber Regulation Committee regarding new planting, Ceylon is permitted to plant an additional 30,000 acres. Reports state that already applications have been received for planting 95,000 acres. This score alone will cause much discontent here. But rubber growers find more serious grounds for dissatisfaction in the circumstance that the local government, aiming to relieve unemployment, proposes to offer rights for new rubber planting first to peasants and middle class Ceylonese who have never planted rubber before and may lend money to these people for opening up and planting the land. Members of at least two planters' associations are known to have passed resolutions protesting against this action and insisting on the rights of present proprietors.

JAPAN

The Japanese concern, the Nippon Denko Kaisha, has obtained a license from the I. G. Farbenindustrie to manufacture synthetic rubber according to the processes developed by the German concern, the *Indische Mercuur* learns. This apparently refers to the Buna rubbers. The Japanese firm is said to have agreed to pay I. G. Farbenindustrie royalty amounting to not less than three dollar cents per kilos of rubber produced.

Crude rubber imports during the first five months of 1938 were 23,114 tons, against 36,222 tons in the same period of 1937. Imports so far this year have averaged 4,623 tons monthly, against 4,317 tons in the third quarter and 1,808 tons monthly in the last quarter of 1937.

Since early July, 1938, restrictions on the use of rubber are said to have increased. Economic organizations working with the government are urging the extended use of reclaimed rubber to save crude rubber. It was pointed out that a saving of 10,000,000 yen could be effected in 1938 by stopping the production of certain rubber articles and encouraging reclaim. At present Japan consumes only 8,000 tons, but this could be increased to 18,000 tons.

The Bridgestone Tire Co., the leading Japanese tire firm, is reported to be increasing production of reclaim and also plans to make synthetic rubber.

INDO-CHINA

Owners of medium and small rubber estates plan to form a cooperative society to sell their rubber. The society will not only undertake to sell the rubber at the best prices, but will buy packing-cases and different materials needed for preparing rubber, at cheaper rates, and will also seek to obtain better transportation facilities, etc.

During June, 1938, exports of crude rubber from Indo-China came to 4,852,385 kilos, to bring the total for the first half of 1938 to 24,296,058 kilos.

NETHERLAND INDIA

Planting Statistics

The 1938 questionnaire shows that the total area of estate rubber plantings at the end of 1937 was 593,625 hectares, of which 229,286 were in Java and Madura and 364,339 in the Outer Provinces. At the end of June, 1938, the total area out of tapping was 185,394 hectares, against 162,148 hectares in May. The area of young tappable trees that have never been tapped was reported at 24,622 hectares in June.

Exports

The exceptionally high rubber exports of July were not maintained in August; on the contrary there was a sharp drop. The total for the month was 23,524,459 kilos against 35,638,077 kilos the month before. This decline was for the most part due to heavily reduced shipments of native rubber.

According to the Central Bureau of Statistics, Java and Madura shipped 4,833,066 kilos of estate rubber including 15,836 kilos latex. In addition, 51,005 kilos were shipped in the form of tires, as compared with 40,447 kilos the month before. Estate rubber exports from the Outer Provinces came to 7,794,300 kilos including 298,088 kilos latex. Native rubber from the Outer Provinces was only 10,846,088 kilos.

Preliminary figures for September show a further drop in rubber exports. Estate rubber from Java and Madura was only 4,125 tons; estate rubber from the Outer Provinces, 7,162 tons; and native rubber from the Outer Provinces, 9,238 tons.

New Japanese Factory?

If negotiations go through, Java is to have a second large rubber factory, according to local papers. This factory, it appears, would be erected by the Japanese firm, Yatjiyo Shokai, which already operates a small factory in Soerabaia, where rubber footwear and packing are the chief articles produced. The new works, it is said, would concentrate chiefly on goods suitable for export, and attempts will be made to expand existing markets. Meanwhile, discussions on the subject with the Industrial Section of the Department of Economic Affairs have still to be commenced.

Latex Factory Opened

The latex factory of the Amsterdam Co. at Belawan-Deli (Sumatra) opened in August. Shipping now takes place by tank steamers instead of in drums, to save transportation cost.

Synthetic Rubber

(*Continued from page 66*)

present is about 500 kilos.

Ethanite, like "Thiokol," is a polymerization product resulting from the reaction of ethylene chloride and sodium polysulphide. It is obtained in the form of homogeneous sheets of a greenish color having a characteristic odor of sulphur and ethylene. The specific gravity is 1.20 to 1.59 according to the quality; total combined sulphur, 80 to 84%; free sulphur, nil. It is also produced as a powder, paste, or rather thick liquid.

Besides being an antioxidant and resisting most acids, alcohols, fats, solvents etc., it is said to stand heat and cold better than natural rubber, has a dielectric coefficient double that of the best insulators, resists abrasion 17 times better than ordinary rubber, and is almost completely impermeable to gases, even Yperite. While it is less elastic than the natural rubber, its elasticity is sufficient for all finished products.

Worked like rubber and on the same machines, it is reported capable of being vulcanized in any form, soft or hard, with or without sulphur. As a basic material, Ethanite is used for various kinds of hose, valves, joints, etc., for the petroleum and chemical industries, also in making insulators, separators, cables, gas masks, etc.; it can be used for tires and for rubber parts in automobiles; in its liquid state it serves as an anti-corrosion coating and is valuable for proofing balloon fabrics.

Used in combination with natural rubber, it is claimed to improve the latter's aging qualities, permit curing without sulphur, an important factor in the production of insulations, and increases adhesion as well as resistance to abrasion, acid, solvents, etc.

Poland

From time to time rumors have been abroad that Poland was manufacturing an artificial rubber known as Ker.[3] According to a report from the United States commercial attache at Warsaw, the Polish Chemical Association recently announced that Ker is to be produced on an industrial scale. A large building has been erected for the purpose at Debica, the new industrial center of Poland, by an organization said to have a capital of about $200,000. According to Polish claims, the cost of production, when at maximum capacity, is on the average from 65 to 75% of the cost of importing natural rubber, including custom duties. But, it is admitted, that it is not expected that maximum capacity will be reached for some time.

France

In discussing the possibilities of synthetic rubbers, F. Jacobs points out, with some acerbity, that while America, Russia, and Germany have been producing synthetic rubbers for some time and even Italy, Czechoslovakia, and Poland are building factories for this purpose, nothing at all has been done in France.

Some work has been done in connection with producing cheaper reclaim and rubber substitutes; the Société Nobel Française manufactures vinyl products, known as Revylite, similar to the German Igelites, but otherwise France is singularly backward in regard to the production and even the use of synthetic rubbers.

[3] *Caoutchouc & gutta-percha*, Aug. 15, 1938, pp. 223-24; Sept. 15, pp. 251-53.

Patents and Trade Marks

MACHINERY

United States

2,129,203. **Apparatus to Heat Treat Rubber-Coated Metallic Members.** R. A. Dufour, Paris, and H. A. Leduc, Mantes-Gassicourt, both in France.

2,130,627. **Tire Cutter.** J. L. Kelly, Los Angeles, Calif.

2,130,739. **Apparatus to Treat Sheet Rubber Surface.** F. Honig, Pawtucket, R. I., assignor to United States Rubber Products, Inc., New York, N. Y.

2,131,979. **Tire Tester.** E. Seidl, Berlin-Westend, Germany.

2,132,324. **Remover of Bands from Building Drums.** H. P. Schrank, Akron, O., assignor to Seiberling Rubber Co., a corporation of Del.

2,132,788. **Heel Making Apparatus.** R. R. Hunt, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

2,132,819. **Fender Making Apparatus.** P. P. Crisp, Stow, and W. E. Haggan, assignors to Firestone Tire & Rubber Co., both of Akron, both in O.

2,132,834. **Tire Building Form.** H. D. Stevens and R. W. Allen, assignors to Firestone Tire & Rubber Co., all of Akron, O.

2,132,835. **Cutter.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,142,896. **Tire Stripper.** W. G. Fritts, Lexington, N. C.

2,132,971. **Machine to Form Knit Elastic Fabric.** L. Roques, assignor to Louis Roques & Georges Arrachequesne, both of Paris, France.

2,133,019. **Mold.** S. T. Campbell, assignor to Aetna Rubber Co., both of Cleveland, O.

Dominion of Canada

377,049. **Tire Fabric Applier.** Wingfoot Corp., Wilmington, Del., assignee of P. Keller, Akron, O., both in the U. S. A.

United Kingdom

486,533. **Tennis Ball Tester.** G. Spencer Moulton & Co., Led., and J. M. Chrystal.

487,130. **Rubber Sheeting Machine.** J. Cairns.

487,334. **Sponge Rubber Production Apparatus.** International Latex Processes, Ltd., E. A. Murphy, A. A. Round, and T. Norcross.

487,350. **Mold.** International Latex Processes, Ltd., E. W. Madge, A. A. Round, and T. Norcross.

487,638. **Rubber Machine.** M. Roca and E. Guix.

487,948. **Rubber Treating Machine.** Callender's Cable & Construction Co., Ltd., E. Bowyer, and G. M. Smith.

488,014. **Vulcanizer.** O. Keller.

488,106. **Machine for Applying Adhesive Tape to Seams.** British United Shoe Machinery Co., Ltd.

488,222. **Footwear Mold.** Rollman, Kaufmann & Co. and A. Szereny.

488,245. **Apparatus for Variegated Rubber.** E. Frolich.

488,422. **Hollow Rubber Article Mold.** Hungarian Rubber Goods Factory, Ltd.

Germany

664,604. **Device and Method for Making Rubber-Trimmed Canvas Shoes.** I. and L. Dorogi and Hungarian Rubber Goods Factory, Budapest, Hungary. Represented by J. Reitstotter, Berlin.

665,440. **Belt Vulcanizer.** Boston Woven Hose & Rubber Co., Cambridge, Mass., U. S. A. Represented by G. Bertram, K. Lengner, and H. Kosel, all of Berlin.

PROCESS

United States

2,129,421. **Manikin.** L. R. Hales, Elmhurst, N. Y.

2,129,607. **Making Rubber Articles.** J. F. Schott, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

2,129,622. **Flooring.** F. H. Manchester, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,129,623. **Rayon Treatment.** W. H. Nicol, Cuyahoga Falls, O., assignor to Wingfoot Corp., Wilmington, Del.

2,129,626. **Tire.** T. A. Riehl, Akron, O., assignor to Wingfoot Corp., Wilmington, Del.

2,130,008. **Chemically Resistant Rubber Coatings.** H. H. Harkins, River Edge, N. J., assignor to United States Rubber Products, Inc., New York, N. Y.

2,130,177. **Hollow Rubber Articles.** J. H. Doak, Portland, Ore.

2,130,905. **Hard Rubber Products.** H. J. Schelhammer, Whitestone, assignor to American Hard Rubber Co., New York, both in N. Y.

2,130,921. **Dress Shields.** M. E. Hansen, assignor to American Anode, Inc., both of Akron, O.

2,131,022. **Artificial Compositions.** S. J. B. ten Cate, Kootwijk, Netherlands.

2,131,073. **Expanded Rubber.** D. Roberts, New York, N. Y., and J. S. Reid, Cleveland, O.; said Reid assignor to Rubatex Products, Inc., New York, N. Y.

2,131,333. **Concentrating Aqueous Rubber Dispersions.** H. D. G. von Schweinitz, Frankfurt - a.M. - Hochst, Germany, assignor, by mesne assignments, to Revertex, Ltd., London, England.

2,131,720. **Knitted Fabric.** E. St. Piere, Pawtucket, assignor to Hemphill Co., Central Falls, both in R. I.

2,131,727. **Confection Handle.** H. E. Davis, Akron, O.

2,131,981. **Elastic or Rubber Thread.** T. L. Shepherd, London, England.

2,131,982. **Rubber Process.** T. L. Shepherd, London, England.

2,131,983. **Elastic Yarn.** T. L. Shepherd, London, England.

2,131,064. **Treating Latex.** C. W. Wilson, Corona, assignor to California Fruit Growers Exchange, Los Angeles, both in Calif.

2,132,096. **Making Deposited Rubber Articles.** E. O. Brueggeman, Akron, assignor to Seiberling Latex Products Co., Barberton, both in O.

2,132,185. **Coverings.** H. M. Pryale, S. C. Clark, and W. S. Vrooman, assignors to Baldwin Rubber Co., all of Pontiac, Mich.

2,132,230. **Protective Coating.** L. G. Copeman, assignor to Copeman Laboratories Co., both of Flint, Mich.

2,132,268. **Surface Finishing Rubber Goods.** M. T. Mallard, Fairfield, Conn., assignor to General Electric Co., a corporation of N. Y.

2,132,501 and 2,132,502. **Rubber Film Manufacture.** P. H. Watkins, Sandusky, O., assignor, by mesne assignments, to United States Rubber Products, Inc., New York, N. Y.

2,132,505. **Plasticizing Rubber.** I. Williams, Woodstown, and C. C. Smith, Carneys Point, both in N. J., assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,132,809. **Oxidation Products of Rubber.** H. P. Stevens and F. J. W. Popham, both of London Bridge, assignors, by mesne assignments, to British Rubber Producers' Research Association, London, both in England.

2,132,927. **Robe Rail.** F. A. Best, Windsor, Ont., Canada.

2,133,040. Production of Rubber from Poinsettia Serum. H. E. Pitman, St. Louis, Mo.

Dominion of Canada

376,586. **Pavement Joint.** B. F. Goodrich Co., New York, N. Y., assignee of G. J. Irwin and E. Meyer, coinventors, both of Akron, O., both in the U. S. A.

376,610. **Floor Covering.** Mishawaka Rubber & Woolen Mfg. Co., assignee of G. W. Blair and J. F. Schott, coinventors, all of Mishawaka, Ind., U. S. A.

376,853. **Elastic Textile Product.** Hevaloid Corp., Delaware City, Del., U. S. A., assignee of Cela Holding S.A., assignee of L. S. M. Lejeune, both of Paris, France.

376,902. **Boxing Glove.** E. J. Cartier, Birchcliffe, inventor, and W. Conley, Toronto, assignee of one-half of the interest, both in Ont.

United Kingdom

486,827. **Retreading Tires.** S. Tunbridge.

487,275. **Coloring Rubber.** Soc. of Chemical Industry in Basle, Switzerland.

487,307. **Rubber Thread.** International Latex Processes, Ltd.

487,990. **Treating Textiles.** Cela Holding Soc. Anon.

488,694. **Sheet Material.** International Latex Processes, Ltd.

488,699. **Elastic Fabric.** International Latex Processes, Ltd.

488,809. **Glove.** J. P. Boiardi, and F. W. Wren.
488,938. **Porous Chlorinated Rubber.** E. Moores, A. P. Lowes, Imperial Chemical Industries, Ltd., and J. P. Baxter.
489,031. **Sponge Rubber.** J. A. Talalay.

CHEMICAL

United States

2,128,944 and 2,128,945. **Rubber Preservative.** W. N. Jones, Pittsburgh, Pa., assignor to B. F. Goodrich Co., New York, N. Y.
2,129,126. **Latex Adhesive.** W. E. Glancy, Waltham, assignor to Hood Rubber Co., Inc., Watertown, both in Mass.
2,129,135. **Rubber Preservative.** W. N. Jones, Pittsburgh, Pa., assignor to B. F. Goodrich Co., New York, N. Y.
2,129,289. **Rubber-Like Fluorine Compounds.** J. Söll, Leverkusen-I. G. Werk, assignor to I. G. Farbenindustrie A.G., Frankfurt a.M., Germany.
2,129,422. **Rubber-Containing Lubricant.** J. F. Hall, assignor to Ironsides Co., both of Columbus, O.
2,129,525. **Accelerators.** A. M. Clifford, Stow, O., assignor to Wingfoot Corp., Wilmington, Del.
2,129,615. **Vulcanizing Agent.** W. C. Calvert, Oak Park, Ill., assignor to Wingfoot Corp., Wilmington, Del.
2,130,242. **Vulcanizing Agents.** W. E. Messer, Cheshire, Conn., assignor to United States Rubber Products, Inc., New York, N. Y.
2,130,264. **Plastic Composition of Rubber and Chlorinated Diphenyl.** F. M. Clark, Pittsfield, Mass., and J. H. Koenig, Columbus, O., assignors to General Electric Co., a corporation of N. Y.
2,131,126. **Vulcanizing Agent.** W. P. ter Horst, Packanack Lake, N. J., assignor to United States Rubber Co., New York, N. Y.
2,131,127. **Accelerator.** W. P. ter Horst, Silver Lake, O., assignor to United States Rubber Co., New York, N. Y.
2,131,206. **Rubber Preservative.** I. Williams, Woodstown, N. J., and A. M. Neal, assignors to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.
2,131,210. **Accelerator.** W. Baird and J. S. H. Davies, both of Blackley, Manchester, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.
2,131,244. **Vulcanizing Agent.** I. Williams, Woodstown, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
2,131,245. **Vulcanizing Agent.** I. Williams, Woodstown, N. J., and F. R. Mayo, assignors to E. I. du Pont de Nemours & Co., both of Wilmington, Del.
2,131,750. **Latex Binding Composition.** B. L. Postlethwaite, Newark, O., assignor to Owens-Illinois Glass Co., a corporation of O.
2,131,790. **Pickling Inhibitor for Metal.** W. P. ter Horst, Packanack Lake, N. J., assignor to United States Rubber Products, Inc., New York, N. Y.
2,132,454. **Hydroxy Amino Compounds.** H. H. Bassford, Jr., Naugatuck. Conn., assignor to United States Rubber products, Inc., New York,, New York.
2,132,665. **Rubber Hydrochloride Compound.** F. E. Williams, Gary, Ind., assignor to Marbon Corp., Chicago, Ill.
2,132,847. **Rubber-Containing Lubricant.** M. A. Dietrich, assignor to E. I. du Pont de Nemours & Co., both of Wilmington, Del.
2,133,116. **Vulcanizing Agent.** W. Schrauth, Berlin-Dahlem, assignor to Deutsche Hydrierwerke A.G., Berlin-Charlottenburg, both in Germany.

Dominion of Canada

376,702. **Rubber Plasticizer.** Canadian Industries, Ltd., Montreal, P. Q., assignee of I. Williams, Woodstown, and C. C. Smith, Carney's Point, co-inventors, both in N. J., U. S. A.
376,703. **Rubber-Coloring Composition.** Canadian Industries, Ltd., Montreal, P. Q., assignee of M. Jones and W. F. Smith, both of Blackley, England, and A. Stewart, Grangemouth, Scotland.
376,824. **Chewing Gum Base.** Sweets Laboratories, Inc., assignee of J. O. Barker, both of New York, N. Y., U. S. A.
376,924. **Chlorinated Rubber Coating Composition.** M. F. Monbiot, London, England.
377,029. **Rubber Mixture.** Shell Development Co., San Francisco, Calif., U. S. A., assignee of J. R. de Jong, Amsterdam, The Netherlands.

United Kingdom

486,878. **Isomerized Rubber.** I. G. Farbenindustrie A.G.
487,101. **Latex-Cement-Cork Compositions.** G. Schuster, F. Hoffman, and E. Kubler & Co.
487,167. **Chlorinated Rubber Compositions.** J. G. Moore, L. T. Dod, and Imperial Chemical Industries, Ltd.
487,168. **Chlorinated Rubber.** J .P. Baxter, L. T. Dod, B. P. Habgood, and Imperial Chemical Industries, Ltd.
487,855. **Emulsifying Agent.** T. W. Dickeson.
487,980. **Antioxidant.** Firestone Tyre & Rubber Co., Ltd.
488,035. **Vulcanizable Rubber Hydrohalide Compositions.** W. J. Tennant (Marbon Corp.).
488,110. **Chlorinated Rubber and Rubber Hydrochloride.** S. K. Smith, H. Dodd, and Imperial Chemical Industries, Ltd.
488,138. **Accelerators.** Wingfoot corp.
488,213. **Synthetic Rubber.** W. W. Triggs (E. I. du Pont de Nemours & Co.).
488,265. **Latex Stabilizers.** G. P. Davis.
488,363. **Denture Composition.** H. Gerlach.
488,557. **Latex-Oil Adhesive.** Dunlop Rubber Co., Ltd., D. F. Twiss, and A. E. T. Neale.
488,595. **Dyestuffs for Coloring Rubber.** Compagnie Nationale De Matieres Colorantes Manufactures De Produits Chimiques Du Nord Reunies Etablissements Kuhlmann.
488,691. **Accelerators.** Wingfoot Corp.
488,692. **Rubber-Carboxylic Acid Compositions.** I. G. Farbenindustrie A.G.
488,701. **Stabilizer for Degraded Rubber.** I. G. Farbenindustrie A.G.
488,787. **Resin-Rubber Compositions.** J.Knaggs and Portals, Ltd.
488,866. **Synthetic Rubber Stabilizers.** A. Carpmael, (I. G. Farbenindustries A.G.).
488,910. **Accelerators.** Wingfoot Corp.
488,937. **Chlorinated Rubber Waterproofing Composition.** J. G. Moore, E. Moores, and Imperial Chemical Industries, Ltd.
489,157. **Antioxidants.** Monsanto Chemical Co.
489,202. **Accelerators.** Wingfoot Corp.
489,205. **Antioxidants.** J. R. Geigy A.G.

GENERAL

United States

2,128,977. **Syringe.** A. E. Whitetree, assignor of one-third to S. Grammatico, one-sixth to T. J. La Lone and one-sixth to L. L. Harvey, all of Flint, Mich.
2,129,054. **Colostomy Appliance.** H. P. Geisler, Jr., Newton, Mass.
2,129,082. **Gum Massager.** R. W. Byrer, Rockford, Ill.
2,129,092. **Garter.** F. W. Keeler, Flint, Mich.
2,129,106. **Footwear.** A. Szerenyi and H. Rollmann, assignors to Rollmann, Kaufmann & Co., Société au nom collectif, both of Brussels, Belgium.
2,129,128. **Tire Casing.** L. Gottlieb, Kansas City, Mo.
2,129,134. **Fountain Pen.** W. F. Johnson, assignor to Mentmore Mfg. Co., Ltd., both of London, England.
2,129,157. **Cable.** E. W. Trolander and W. C. Wilson, assignors to Pyroxylin Products, Inc., all of Chicago, Ill.
2,129,186. **Marking Tube.** F. A. Sturm, Paterson, and G. J. Petricek, Clifton, both in N. J.
2,129,237 and 2,129,238. **Ball.** J. T. Riddell, Chicago, Ill.
2,129,245. **Fish Lure.** W. J. Stenstrom, Federal Dam, Minn.
2,129,257. **Fluid Meter Thrust Rollers.** C. Bachmann, Jackson Heights, N. Y., assignor to Neptune Meter Co., a corporation of N. J.
2,129,291. **Hose and Garter.** G. S. Van Voorhis, Northampton, assignor to United Elastic Corp., Easthampton, both in Mass.
2,129,344. **Shoe Fabric.** W. D. Clement, assignor to Friedberger-Aaron Mfg. Co., both of Philadelphia, Pa.
2,129,400. **Belt.** E. Blossfeld, Oakland, Calif.
2,129,496. **Fingernail Protector.** A. Hollingsworth, New York, N. Y.
2,129,540. **Lead-In for Radio Receivers.** L. H. Van Billiard, Bridgeport, Conn., assignor to General Electric Co., a corporation of N. Y.
2,129,577. **Suspender Shirt.** W. L. Guerin, New Orleans, La.
2,129,696. **Track-Laying Vehicle Track.** H. A. Knox, Washington, D. C.
2,129,720. **Inflated Hat Clock.** G. F. Wilhelm, St. Charles, Mo.
2,129,941. **Bumper Mat.** J. H. King and R. R. Wotring, both of Indianapolis, Ind.
2,129,987. **Apparatus to Cool Dental Impressions.** R. Berkson, Champaign, Ill.
2,130,030. **Pipe Plug.** J. F. Richardson, Ashland, Ky.
2,130,096. **Tire.** L. Lanie, Manchester, Okla.
2,130,127. **Goggles.** C. Fischer, New York, N. Y.

2,130,195. **Fountain Pen.** J. Rogers, Brooklyn, N. Y.

2,130,232. **Dust-Collecting Attachment.** R. E. Goodenough, assignor to Cross Bros. Co., Inc., both of Northfield, Vt.

2,130,366. **Sole Attaching Machine Welt Hold-Down.** C. H. Pepin, Beverly, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

2,130,406. **Saliva Ejector.** R. C. Angell, Prince Bay, N. Y., assignor to S. S. White Dental Mfg. Co., a corporation of Pa.

2,130,413. **Rubber Article.** J. L. Bitter, Johnson City, Tenn., assignor to North American Rayon Corp., New York, N. Y.

2,130,524. **Tire.** E. Clark, East Orange, N. J.

2,130,552. **Garment Supporting Band.** W. Kühn, Stuttgart-Degerloch, assignor to A. Meineke, Lennep (Rheinprovinz), both in Germany.

2,130,594. **Tire.** H. S. Mooradian, assignor to Dayton Rubber Mfg. Co., both of Dayton, O.

2,130,637. **Vacuum Sealing Can.** F. L. Darling, Douglaston, N. Y., assignor, by mesne assignments, to Crown Can Co., Philadelphia, Pa.

2,130,651. **Closure for Cans, etc.** T. W. Phillips, assignor of one-half to Vacseal Containers, Ltd., both of London, England.

2,130,658. **Tire Patch.** H. M. Watson, Omaha, Neb.

2,130,682. **Boot.** W. J. Gruner, Naugatuck, Conn., assignor to United States Rubber Products, Inc., New York, N. Y.

2,130,750. **Line Indicator and Attachment to Notebook.** B. E. Van Alstyne, San Francisco, Calif.

2,130,774. **Fountain Pen.** E. F. I. Michael, assignor of one-half to M. Grill, both of New York, N. Y.

2,130,906. **Undergarment.** J. Scherfer, Chicago, Ill.

2,130,926. **Fountain Pen.** W. G. Nichol, Philadelphia, Pa.

2,130,978. **Fountain Pen.** J. White, Comstock, N. Y.

2,131,016. **Fountain Pen. C. Fiore,** Brooklyn, assignor to E. Gumbel, Woodside, both in N. Y.

2,131,023. **Knot Cover.** E. J. Champagne, Franklin, La.

2,131,111. **Protective Shield for Sinks.** L. A. Marsh, Portland, Me.

2,131,156. **Curtain Position Retainer.** J. W. Yardley, Chicago, Ill.

2,131,283. **Ski Heel.** D. C. Hubbard, Auburn, Me.

2,131,344. **Bathing Cap.** C. J. Crowley, assignor to Seamless Rubber Co., Inc., both of New Haven, Conn.

2,131,345. **Bale Cutter.** R. W. Dinzl, Narberth, Pa., assignor to Baldwin-Southwark Corp., a corporation of Del.

2,131,449. **Polishing Wheel.** C. Mary, Paris, France.

2,131,495. **Lamb-coat.** C. M. Allen, Miles City, Mont.

2,131,534. **Swatter Blade.** M. W. Gatch, assignor to Gatch Wire Goods Co., both of Baltimore, Md.

2,131,544. **Rotary Seal.** A. Weiland, Philadelphia, Pa., assignor to Baldwin-Southwark Corp., a corporation of Del.

2,131,561. **Tire Deflation Indicator Switch.** H. P. Jones, Brawley, assignor of one-fourth to P. Werve, El Centro, both in Calif.

2,131,636. **Tire.** A. H. Nellen, Merion, assignor to Lee Rubber & Tire Corp., Conshohocken, both in Pa.

2,131,654. **Garment.** A. K. Baer, assignor to Strouse-Baer Co., both of Baltimore, Md.

2,131,704. **Tacking Strip.** L. Daly, Winnetka, and F. X. Meiners, Chicago, both in Ill., assignors to Filer Fibre Co., Filer City, Mich.

2,131,721. **Nozzle Packer.** H. B. Hale, Long Beach, Calif.

2,131,746. **Bumper.** W. L. Morison, Lake Forest, Ill.

2,131,756. **Ball.** F. T. Roberts, Malone, N. Y.

2,131,762. **Gasket, Packing, Etc.** E. W. Smith, Melrose, assignor to Submarine Signal Co., Boston, both in Mass.

2,131,855. **Ice Cube Holder.** F. Hummel, Hopewell, Va.

2,131,858. **Noncocking Fishing Spinner.** R. W. Ledrich, Cuyahoga Falls, O.

2,132,033. **Garment.** R. M. Kapinas, assignor, by mesne assignments, to Munsingwear, Inc., both of Minneapolis, Minn.

2,132,050. **Dice.** B. A. Serdynski, assignor, by mesne assignments, of one-half to L. S. Ryczek, both of Milwaukee, Wis.

2,132,060. **Weather Strip.** G. E. Tremblay, Quebec, P. Q., Canada.

2,132,123. **Dough Working Surface Cover.** E. T. Parsons, Upper Montclair, and H. W. Sawyer, Nutley, assignors to Thomson Machine Co., Belleville, all in N. J.

2,132,217. **Sash Construction.** J. C. Neuendorf, Detroit, Mich.

2,132,224. **Vent Plug.** A. H. Snyder, Lancaster, N. Y., assignor to National Battery Co., St. Paul, Minn.

2,132,235. **Electric Conductor.** R. D. Green, assignor to J. A. Roebling's Sons Co., both of Trenton, N. J.

2,132,259. **Cable.** L. Emanueli, Milan, Italy, assignor to Società Italiana Pirelli, a corporation of Italy.

2,132,275. **Tire.** H. E. Skelton, Birmingham, Mich.

2,132,523. **Overshoe.** C. F. Berry, Boston, Mass.

2,132,610. **Combination Garment.** F. Ellinger, Milwaukee, Wis.

2,132,616. **Garment Band.** H. Hardie, assignor to Faultless Mfg. Co., both of Baltimore, Md.

2,132,723. **Packing Element.** C. S. Crickmer and R. A. Lamb, assignors to Merla Tool Co., both of Dallas, Tex.

2,132,730. **Hydraulic Brake.** H. D. Geyer, Dayton, O., assignor to General Motors Corp., Detroit, Mich.

2,132,775. **Sealing Bottle Closure.** F. Casablancas, Sabadell, Spain.

2,132,793. **Battery.** G. L. Kyle, assignor to USL Battery Corp., both of Niagara Falls, N. Y.

2,132,840. **Resilient Mounting.** C. E. Workman and L. M. Kubaugh, assignors to Firestone Tire & Rubber Co., all of Akron, O.

2,132,844. **Hosiery.** G. L. Brill, New York, N. Y.

2,132,864. **Bathing Cap.** R. Suthers, Brooklyn, N. Y.

2,132,870. **Electric Connecter Plug.** H. D. Geyer, Dayton, O., assignor to General Motors Corp., Detroit, Mich.

2,132,894. **Washer.** M. Esnard, Matanzas, assignor of one-fourth to S. H. Rowlett, Habana, both in Cuba.

2,132,906. **Eraser.** F. C. Schnabel, Hopkins, Minn.

2,132,936. **Floor Covering.** S. C. Clark, assignor to Baldwin Rubber Co., both of Pontiac, Mich.

2,132,942. **Pencil and Eraser.** A. W. Forsyth, Maplewood, assignor to Wallace Pencil Co., St. Louis, both in Mo.

2,133,025. **Airplane De-Icer.** J. F. Hamil, Temple, Tex.

2,133,049. **Thread Protector.** J. M. Shimer, assignor to Oil Well Supply Co., both of Dallas, Tex.

2,133,040. **Production of Rubber from Poinsettia Serum.** H. E. Pitman, St. Louis, Mo.

2,133,071. **Cord.** J. Anderson, Sutton Coldfield, and M. Langstreth, Rochdale, assignors to Dunlop Rubber Co., Ltd., London, all in England.

Dominion of Canada

376,569. **Door Operator.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of H. H. Vanderzee, Chicago, Ill., U. S. A.

376,619. **Toy Building Block.** Premo Rubber Co., Ltd., assignee of A. Levy, both of Petersfield, England.

376,756. **Girdle.** Neatform Co., Inc., assignee of M. Goodman, both of New York, N. Y., U. S. A.

376,771. **Spring and Dowel Means.** Transit Research Corp., assignee of E. H. Piron, both of New York, N. Y., U. S. A.

376,825. **Carpet Sweeper.** E. R. Wagner Mfg. Co., assignee of S. Miller, both of Milwaukee, Wis., U. S. A.

376,894. **Wheel Assembly.** Transit Research Corp., New York, N. R., assignee of C. F. Hirshfeld, Detroit, Mich., both in the U. S. A.

376,895. **Wheel Spring Securing Means.** Transit Research Corp., New York, N. Y., assignee of C. C. Hirshfeld, Detroit, Mich., both in the U. S. A.

376,905. **Bolt Anchor.** L. R. Adams, Akron, O., U. S. A.

376,927. **Tooth.** J. M. Nouel C., Caracas, Venezuela.

377,017. **Track Grinding Brick and Adapter.** Norton Co., assignee of T. Larsson, both of Worcester, Mass., U. S. A.

377,035. **Typewriter Platen.** Taylor Silent Platen Co., Ltd., London, England, assignee of W. E. Taylor, Londonderry, Northern Ireland.

377,066. **Tire.** J. Brunswick, Paris Seine, France.

377,068. **Non-Slipping and Shock-Absorbing Device.** E. W. Coleman, South Ruislip, England.

United Kingdom

486,642. **Plastic Sheet Material.** W. W. Triggs, (Woodall Industries, Inc.).

486,671. **Boxing Device.** A. Christophel.

486,673. **Bottle Closure.** Washer. Parozone Co., Ltd., and S. W. Barr.

486,731. **Liquid Dispenser.** T. H. Robert-Shaw.

486,785. **Rubbing Machine.** F. B. Dehn, (Sterling Products Co.).

486,925. **Fabric Expander.** J. H. Wrigley, A. Melville, and S. Kellett.

486,943. **Mineral-Filled Paper Press.** Mead Corp.

486,957. **Bottle Case.** No-Nail Cases Proprietary, Ltd., and A. M. Kamper.

487,074. **Spade Handle Grip.** F. Brighten.

487,092 **Fountain Pen.** S. M. Sager.

487,133. **Grinding Roller.** D. E. Mulholland.

487,161. **Mat.** A. H. Stevens, (Johns-Manville Corp.).
487,165. **Garter.** J. Hausmann.
487,173. **Packing Ring.** C. A. Voigt.
487,203. **Washing Device.** F. C. Shepherdson.
487,207. **Cleaning Appliance.** H. Watling.
487,209. **Brooms.** A. Menz.
487,395. **Breathing and Blood Circulation Apparatus.** F. Kolb.
487,440. **Package Tape.** Marathon Paper Mills Co.
487,450. **Vacuum Cleaner Bumper.** Air-Way Electric Appliance Corp.
487,473. **Luggage Carrier.** O. Lecanu-Deschamps.
487,532. **Sandblast.** A. Stephen & Sons, Ltd., and J. G. Stephen.
487,545. **Sphygmometer.** G. G. Wolff and E. Achillopulo.
487,555. **Floor Covering.** Mannington Mills, Inc.
487,579. **Hinge.** Soc. of Chemical Industry in Basle, Switzerland.
487,582. **Piston Packing.** F. V. Brown.
487,599. **Joint.** M. Goldschmidt.
487,600. **Bootmaking Machine.** United Shoe Machinery Corp.
487,611. **Glass Cutter.** A. T. Jordan, and P. Lever.
487,643. **Helmet.** E. Furler.
487,648. **Artificial Filaments.** Naamlooze Vennotschap Maatschappij Tot Beheer En Exploitatie Van Octrooien.
487,655. **Brush.** J. Siemss.
487,689. **Bumper.** F. L. Blenkinsop.
487,703. **Joint.** Hardy, Spicer & Co., Ltd., T. F. Green.
487,715. **Electrode.** Co. Generale D'Electricite.
487,730. **Hair Curler.** M. Straus and A. Schubert, (trading as M. Straus & Co.).
487,743. **Adhesive Dressing.** W. Mather, Ltd., and E. Berry.
487,747. **Cleaning Material Strip Holder.** Platers & Stampers, Ltd., and C. E. Kail.
487,753. **Gas Mask.** G. Ingram.
487,767. **Vehicle Spring Suspension.** Briggs Mfg. Co.
487,774. **Tank.** H. H. Hollis.
487,780. **Joints.** M. Goldschmidt.
487,788. **Abrasive Wheels.** Carborundum Co.
487,790. **Coupling.** R. Bosch A.G.
487,794. **Lay Figure.** F. C. Lawrence and Display Industries, Ltd.
487,801. **Vacuum Cleaner.** Airway Electric Appliance Corp.
487,823. **Splint.** Kohl's Scientific Instruments, Ltd.
487,843. **Polishing Machine.** P. De V. D'Avaucourt.
487,883. **Vacuum Cleaner Nozzle.** Co-Operative Wholesale Society, Ltd., and R. H. Line.
487,897. **Stuffing Box Substitutes.** Pulsometer Engineering Co., Ltd., and R. Warren.
487,924. **Textile Roller.** Sonoco Products Co.
487,942. **Fountain Pen.** Mentmore Mfg. Co., Ltd., and W. F. Johnson.
487,960. **Joints.** Guy & Murton, Inc.
487,967. **Furniture Adjustment.** Dale Forty Engineering Co., Ltd., and F. W. Wilkes.
487,987. **Shock Absorber.** A. A. M. Beurdeley.
488,072. **Fluid-Pressure Control System.** Sulzer Freres Soc. Anon.
488,075. **Stuffing Box Packing.** Buderus'sche Eisenwerke.
488,077. **Pipe Joint Mold.** H. Fluckiger.
488,080. **Coated Fabrics.** W. F. Feinbloom.
488,091. **Vehicle Spring - Suspension.** Monroe Auto Equipment Co.
488,125. **Floor Structure.** G. G. King.
488,127. **Composite Building Plate.** G. Schuster, and F. Hoffmann.
488,129. **Filter Bag.** Visco Engineering Co., Ltd., and L. C. Ellis.
488,134. **Rollers of Drawing Frames to Collect Dust, Fly, Etc.** Akt.Ges. J. J. Rieter & Cie.
488,135. **Door Holder.** W. J. Butts.
488,156. **Tennis Racket.** H. L. Fletcher.
488,186. **Tank.** A. J. Henderson.
488,200. **Apparatus to Secure Gear Wheels on Shafts.** J. Stone & Co., Ltd., and E. C. Hatcher.

TRADE MARKS

United States

359,934. **Trail Blazer.** Hose. G. Worthington Co., Cleveland, O.
359,962. Representation of a label containing the words: **"Tire Upkeep Equipment. Safety Sealed."** Tire and tube repair vulcanizers, tire retreaders, etc. Safety Vulcanizer Co., Chicago, Ill.
359,985. **Toe Action Tread.** Tires. Dayton Rubber Mfg. Co., Dayton, O.
359,991. **Broadway.** Prophylactic articles. Broadway Drug Products Co., New York, N. Y.
360,022. Representation of a man fastening a garter on his sock and the word: **"Paris"** underneath. Garters, suspenders, etc. A. Stein & Co., Chicago, Ill.
360,053. **"Darleen."** Elastic yarn. Darlington Fabrics Corp., New York, N. Y.
360,054. **Reliatex.** Artificial leather. Reliable Textile Co., Chicago, Ill.
360,138. **Filmstar.** Dress shields. I. B. Kleinert Rubber Co., New York, N. Y.
360,204. **Royal Special Service.** Tires. United States Rubber Products, Inc., New York, N. Y.
360,205. **Corprene.** Bushings, rolls, roll covers, sheet handling equipment, etc. Armstrong Cork Products Co., Lancaster, Pa.
360,211. **Pla-Tyme-Klub.** Balls. United Profit-Sharing Corp., New York.
360,217. **Marvel Mold.** Corsets, brassieres, etc. Comet Corset Co., Inc., New York, N. Y.
360,235. Representation of a triangle with ruled designs and the words: **"Giant Grip."** Non-slip carpet cushioning. Densten Felt & Hair Co., Philadelphia, Pa.
360,239. Representation of a label and the word: **"Keystone."** Suspenders, garters, girdles, etc. Pittsburgh Garter Co., Pittsburgh, Pa.
360,245. **Lady Mac.** Corsets, brassieres, etc. Lady Mac of Canada, Ltd., Toronto, Ont., Canada.
360,265. **Cheer Leader.** Foundation garments. Neatform Co., Inc., New York, N. Y.
360,274. **Parap.** Wax-rubber tape. Menasha Products Co., Menasha, Wis.
360,286. **Wearite.** Garters. W. T. Grant Co., New York, N. Y.
360,295. **Bounders.** Heel cushions. General Tire & Rubber Co., Akron, O.
360,304. **"Nakette."** Corsets, foundation garments, etc. La Resista Corset Co., Bridgeport, Conn.
360,335. Representation of a star and the word: "Comet." Prophylactic articles. R. J. Pierce, Inc., New York, N. Y.
360,342. **Separettes.** Girdles. Wolfe & Lang, Inc., New York, N. Y.
360,349. **Doff and Don.** Gloves. Edmont Mfg. Co., Coshocton, O.
360,377. **Finalist.** Golf balls. Acushnet Process Co., Acushnet, Mass.
360,386. **Trico.** Hose. Trico Products Corp., Buffalo, N. Y.
360,387. **Brentwood Levy Brothers.** Corsets and brassieres. Levy Bros., Inc., Elizabeth, N. J.
360,396. **Grip-Tite.** Suspenders. Swank Products, Inc., Attleboro, Mass.
360,428. Representation of package binding with one red band. Bathing caps, baby pants, and swim pants. International Latex Corp., Rochester, N. Y.
360,429. Representation of package binding consisting of three narrow red bands. Bathing caps, baby pants, and swim pants. International Latex Corp., Rochester, N. Y.
360,440. **"Wearever Dip It."** Fountain pens and erasers. D. Kahn, Inc., North Bergen, N. J.
360,523. Triangle containing the letter: **"R"** and the words: **"Quality Service Reliable."** Goods with a fibrous base treated with pyroxylin or rubber. Reliable Textile Co., Chicago, Ill.
360,582. **Crepe Seraphim.** Corsets and brassieres. Garfinkel & Ritter, New York, N. Y.
360,606. **Mitsies.** Mitts. I. B. Kleinert Rubber Co., New York, N. Y.
360,651. **Opalex Paratex.** Filler for rubber compositions. New Hampshire Diatomite Co., Portsmouth, N. H.
360,691. **Kapelet.** Make-up and shampoo capes. I. B. Kleinert Rubber Co., New York, N. Y.
360,705. **Corky.** Gaskets and non-metallic washers. Armstrong Cork Products Co., Lancaster, Pa.
360,836. **Donna-Form.** Girdles, corselets, etc. A. J. Donahue Corp., Milford, Conn.
360,857. Representation of a bust of a boy in sou'wester and the words: **"Safety Coat."** Coats of rubberized waterproof material. United States Rubber Products, Inc., New York, N. Y.
360,914. **Heat-Pruf.** Tire fabric. Pharis Tire & Rubber Co., Newark, O.
360,933. Representation of a crown and the words: **"Sovereigns 'for those who discriminate.'"** Prophylactic articles. Excello Hygienic Products Corp., assignor, by mesne assignments, to M. Cohen, both of New York, N. Y.
361,127. **Lightning.** Tires and tubes. Pharis Tire & Rubber Co., Newark, O.
361,255. **Perbunan.** Synthetic rubber and rubber-like materials. I. G. Farbenindustrie A.G., Frankfurt a.M., Germany.
361,258. **"Permacell."** Vulcanized sponge rubber for vibration dampening mountings. United States Rubber Products, Inc., New York, N. Y.
361,261. **Ledate.** Ultra-accelerator. R. T. Vanderbilt Co., Inc., New York, N. Y.
361,313. **Superib.** Tire casings. Corduroy Rubber Co., Grand Rapids, Mich.
361,319. **"75."** Tires. Fisk Rubber Corp., Chicopee Falls, Mass.
361,339. **Blue Ray.** Golf balls. Acushnet Process Co., Acushnet, Mass.
361,340. **Green Ray.** Golf balls. Acushnet process Co., Acushnet, Mass.

Market Reviews

CRUDE RUBBER

Commodity Exchange

TABULATED WEEK-END CLOSING PRICES

Futures	Aug. 27	Sept. 24	Oct. 1	Oct. 8	Oct. 15	Oct. 22
Sept.	16.57	16.00	.....	.....	.....	.....
Oct.	16.64	16.00	16.70	17.24	17.05	16.80
Dec.	16.78	16.14	16.77	17.30	17.19	16.90
Mar.	16.92	16.25	16.77	17.34	17.20	16.97
July	17.05	16.40	16.84	17.36	17.21	16.98
Sept.	.....	.....	16.86	17.40	17.30	17.07
Volume per week (tons)	24,240	11,450	32,860	17,040	15,630	11,860

New York Quotations

New York outside market rubber quotations in cents per pound

	Oct. 27, 1937	Sept. 26, 1938	Oct. 26, 1938
Plantations			
Rubber latex..*gal.*	55/56	57/58	61/62
Paras			
Upriver fine	17	15⅝	15¼
Upriver fine	*20¾	*18¼	*18¾
Upriver coarse	10½	10	10
Upriver coarse	*15	*15¼	*14¾
Islands fine	16	15	15
Islands fine	*19	*17¾	*17½
Acre, Bolivian fine	17¼	15⅞	15⅝
Acre, Bolivian fine	*21	*18½	*18½
Beni, Bolivian fine	17¾	16½	16
Madeira fine	17¼	15⅝	15½
Caucho			
Upper ball	10¼	10	10
Upper ball	*15	*15¼	*14½
Lower ball	10	9	9¾
Pontianak			
Pressed block	16/32	12/20	11/20
Guayule			
Duro, washed and dried	13½	13¾	13¾
Ampar	14	13¾	13¾
Africans			
Rio Nuñez	16	17	14
Black Kassai	16	16½	14
Prime Niger flake	25	25	25
Gutta Percha			
Gutta Siak	12	12	11¾
Gutta Soh	25	17½	15
Red Macassar	1.05/1.20	1.20/1.90	1.20/1.85
Balata			
Block, Ciudad Bolivar	30	..	..
Manaos block	27	27½	27
Surinam sheets	37	39	39
Amber	42	40	42

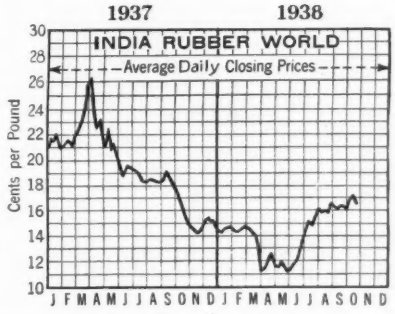
*Washed and dried crepe. Shipments from Brazil.

THE Commodity Exchange table published here shows prices of representative future contracts on the New York market during the last two months.

Following a settlement of the European crisis, the rubber market moved upward during early part of October and then eased somewhat toward the latter part of the month under the influence of developments within the trade. After closing at 16.77¢ per pound on October 1, March futures advanced to close at 17.34¢ per pound on October 8 to register a new high for the year. Following this the market was easier, losing ground on increased selling by foreign interests and commission houses to close at 16.82¢ per pound on October 24. The closing price on October 27 was 16.96¢ per pound. During the past four weeks, the maximum variation in week-end closing prices for delivery during the next year was 0.25¢ per pound. Trading during the month was only moderate.

Crude rubber consumption in the United States for September showed a decrease of less than 1% under August and was 13.93% under September a year ago. September consumption was slightly less than was generally anticipated by the trade, but optimism still prevails regarding an active fourth quarter. On page 80 are reported U. S. statistics on imports, consumption, stocks, and crude rubber afloat.

The next meeting of the International Rubber Regulation Committee is scheduled for November 15 when, it is believed, action will be taken on establishing the quota for the first quarter of 1939. In this connection it should be pointed out that if the present world consumption estimated at 80,000 tons monthly continues and the present quota of 45% is maintained, even with the increased basic quotas to go in effect in January, world stocks will show a marked decline. If United States consumption averages over 40,000 tons monthly, as it is expected to, the decline in world stocks probably would be substantial enough seriously to impair the present price structure. With an increase of export quota to 55% for the first quarter of 1939, together with expected shipments by non-participating countries, total rubber shipments would amount to about 77,600 tons, which would be still under the present world consumption figure of 80,000 tons, monthly. Thus world stocks would continue to decline despite the higher rate of shipments.



New York Outside Market—Spot Ribbed Smoked Sheets

According to a Department of Commerce release, rubber interests in British Malaya are of the opinion that the larger estates will not take full advantage of the new ruling which permits accumulation of three months' stocks on the basis of their quota. Chief reasons are lack of facilities and finances or unwillingness to finance the undertaking. Owners of small estates and native growers, together representing a considerable portion of total acreage, are not expected to accumulate stocks in view of their past performances.

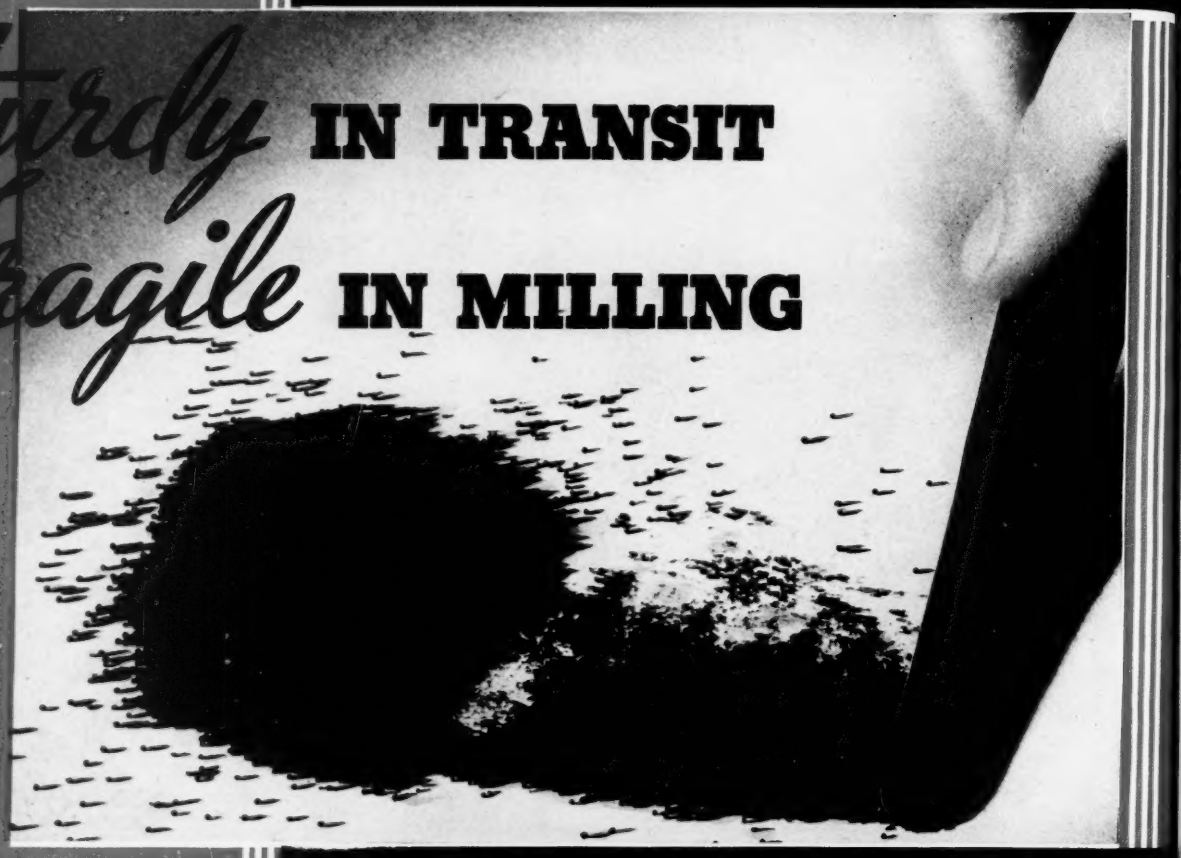
The report of the New York Outside Market is given on page 78.

New York Outside Market—Spot Closing Prices—Plantation Grades—Cents per Pound

	September, 1938					October, 1938																	
	26	27	28	29	30	1	3	4	5	6	7	8	10	11	12*	13	14	15	17	18	19	20	21	22
No. 1 Ribbed Smoked Sheet	16	15 7/8	15 3/4	16 1/8	16 1/8	16 1/16	16 5/8	16 3/4	17	16 13/16	17	17 1/8	17 1/8	17 1/8	..	16 13/16	17	17 1/16	16 7/8	16 13/16	16 7/8	16 13/16	16 7/8	16 7/8
No. 2 Ribbed Smoked Sheet	15 13/16	15	15 7/8	15 3/4	16 1/4	16 3/8	16 1/8	16 7/8	16 5/8	16 7/8	16 5/8	16 13/16	16 13/16	16 3/4	..	16 7/8	16 5/8	16 3/4	16 1/2	16 7/8	16 1/2	16 7/8	16 7/8	16 7/8
No. 3 Ribbed Smoked Sheet	15 7/8	14 7/8	15	15 1/4	15 1/2	15 1/16	15 1/16	15 1/16	16 1/8	16	16 1/8	16 3/4	16 3/4	16 7/8	..	16	16 1/8	16 7/8	15 15/16	16	15 15/16	15 7/8	15 15/16	15 15/16
No. 4 Ribbed Smoked Sheet	14 15/16	14 3/4	14 15/16	15	15 1/2	15 5/8	15 1/2	15 7/8	15 1/2	15 3/4	15 13/16	16	16	15 15/16	..	15 3/4	15 13/16	15 15/16	15 13/16	15 3/4	15 11/16	15 3/4	15 13/16	15 13/16
No. 1 Thin Latex Crepe	17	16 1/2	16 7/8	16 15/16	17 3/8	17 1/2	17 7/8	17 5/8	17 15/16	17 7/8	17 15/16	18 1/16	18 1/16	18 1/8	..	17 7/8	17 15/16	18 1/8	17 15/16	18 1/8	18	17 7/8	18	18
No. 1 Thick Latex Crepe	18	17 1/8	17 7/8	17 15/16	18 1/8	18 1/8	18 1/16	18 1/2	18 15/16	18 3/4	18 13/16	19	19	18 15/16	..	18 3/16	18 15/16	18 15/16	18 3/8	18 7/8	18 3/8	18 1/2	18 5/8	18 5/8
No. 1 Brown Crepe	15 1/4	14 3/16	15 1/8	15 1/8	15 5/16	15 5/16	15 7/16	16	16 1/4	16 1/8	16 1/4	16 7/16	16 7/16	16 3/16	..	16 1/16	16 1/4	16 3/16	16 1/16	16 1/8	16 1/16	16 1/16	16 1/16	16 1/4
No. 2 Brown Crepe	15 1/8	14 1/2	14 15/16	15 1/16	15 5/16	15 5/16	15 3/4	15 13/16	16 1/16	16	16 1/16	16 1/4	16 1/4	16 1/16	..	16	16 1/16	16 1/8	15 15/16	16	15 15/16	15 7/8	16	16
No. 2 Amber	15 1/4	14 3/8	15 1/16	15 1/8	15 5/16	15 5/16	15 7/8	16	16 1/4	16 1/8	16 1/4	16 7/16	16 7/16	16 3/8	..	16 1/16	16 1/4	16 3/8	16 1/8	16 1/16	16 1/16	16 1/16	16 1/8	16 1/8
No. 3 Amber	15 1/8	14 1/2	14 15/16	15 1/16	15 1/4	15 5/16	15 3/4	15 15/16	16 1/16	16	16 1/16	16 1/4	16 1/4	16 1/16	..	16	16 1/16	16 1/16	15 15/16	16	15 15/16	15 7/8	16	16
No. 4 Amber	14 5/8	13 15/16	14 3/8	14 5/8	15 1/16	15 1/16	15 1/16	15 1/16	15 5/8	15 1/8	15 5/8	15 13/16	15 13/16	15 3/4	..	15 1/2	15 1/16	15 1/16	15 1/16	15 1/2	15 1/16	15 3/8	15 3/8	15 3/8
Rolled Brown	13 3/8	12 15/16	13 1/8	13 3/8	14	14 1/8	13 7/8	14 1/8	14 1/16	14 1/16	14 1/4	14 7/16	14 7/16	14 3/8	..	14 1/16	14 1/4	14 3/8	14 3/8	14 1/16	14 3/8	14 3/8	14 3/8	14 3/8

*Holiday.

Sturdy IN TRANSIT
Fragile IN MILLING



BY the simple shearing action of the rubber mass Micronex Beads are reduced thoroughly and completely to their original minute particles suitable for incorporation into rubber. In this respect Micronex Beads are unique.

Such ease of dispersion is due to the patented process by which these beads are made—an exterior just strong enough to hold together the inside porous mass about two-thirds of which is air.

Despite this desirable friability, Micronex Beads are not too fragile. In transportation and in flow systems they exhibit a notable absence of dusting.

BINNEY & SMITH CO.
DISTRIBUTORS
41 EAST 42ND ST., NEW YORK, N. Y.

COLUMBIAN CARBON CO.
MANUFACTURERS

MICRONEX
THE *Premier* CARBON BLACK FOR RUBBER USE
Beads or Compressed

COMPOUNDING INGREDIENTS

OCTOBER witnessed a further steady increase in the demand for compounding ingredients. While improvement has not been rapid, it has been sufficiently consistent to warrant optimistic sentiment regarding operations in the near future. The opinion from most quarters holds that activity will show further steady increases during the balance of this year. Prices in general remain steady at last month's levels.

CARBON BLACK. The demand for rubber blacks during October showed a substantial improvement over the preceding month, and satisfactory business is anticipated for the remainder of the year. Prices continue at the level they have occupied for some time.

FACTICE OR RUBBER SUBSTITUTE. While there have been indications of increased interest in rubber substitutes, demand has been spotty. It is felt that improvement will depend largely on the extent of future activity in the automotive industry. In general prices remain steady.

LITHARGE. Movement of litharge into consumption during October was at a fair rate, with battery manufacturers supplying most of the recent interest. While prices continue at the levels established September 19, further strengthening influences are being felt.

LITHOPONE. Although some general improvement in sales volume has been noted, demand for lithopone was spotty during the past month. Prices continue without change.

RUBBER CHEMICALS. The demand for rubber chemicals showed a continued steady improvement during October, and this trend is expected to continue during the next few months. Prices in general remain steady.

RUBBER SOLVENTS. The demand for rubber solvents showed an encouraging improvement during the past month. Although crude prices were cut, prices of these solvents were unaffected and continue at long-standing levels.

STEARIC ACID. There has been a steady movement of stearic acid to consumers on contract, but new business has been along conservative lines. Price quotations were unchanged.

TITANIUM PIGMENTS. A definite improvement in demand for titanium pigments from the rubber industry was reported during the past month. Although the actual improvement has not been extensive, it has been sufficiently sustained to indicate a better trend in consumption. Quotations in effect since last June have not been changed and probably will continue in force throughout the current quarter.

ZINC OXIDE. Rubber manufacturers bought fair amounts of zinc oxide during October. A steadily increasing consumption by the rubber industry is anticipated during the remainder of this quarter and the first quarter of 1939. Although metallic zinc prices advanced, prices of the oxides held unchanged.

New York Quotations

October 24, 1938

Prices Not Reported Will Be Supplied on Application

Abrasives			
Pumicestone, powdered	lb.	$0.03	/$0.035
Rottenstone, domestic	lb.	.03	/ .035
Silica, 15	ton	38.00	
Accelerators, Inorganic			
Lime, hydrated, l.c.l., New York	ton	20.00	
Litharge (commercial)	lb.	.07	/ .075
Accelerators, Organic			
A-1	lb.	.26	
A-5-10	lb.	.35	/ .40
A-7	lb.	.42	/ .55
A-10	lb.	.35	/ .40
A-11	lb.	.52	/ .65
A-19	lb.	.52	/ .65
A-32	lb.	.70	/ .80
A-77	lb.	.42	/ .55
A-100	lb.	.42	/ .55
A-100-F-50	lb.	.25	/ .35
A-433	lb.	.45	/ .55
Accelerator 49	lb.	.42	
737	lb.	.42	/ .43
737-50	lb.	.25	/ .26
808	lb.	.70	/ .72
833	lb.	1.15	
Acrin	lb.	.55	
Aldehyde ammonia	lb.	.70	
Altax	lb.	.55	/ .65
B-J-F	lb.	.50	/ .55
Beutene	lb.	.70	/ .75
Butyl Zimate	lb.	2.65	
C-P-B	lb.	2.00	
Captax	lb.	.50	/ .60
Crylene	lb.	.40	/ .47
Paste	lb.	.30	/ .36
D-B-A	lb.	2.00	
Di-Esterex	lb.	.60	/ .70
N	lb.	.60	/ .70
DOTG	lb.	.44	/ .47
DPG	lb.	.35	/ .45
El-Sixty	lb.	.50	/ .65
Ethylideneaniline	lb.	.42	/ .43
Ethyl Zimate	lb.	2.65	
Formaldehyde P.A.C.	lb.	.0625	
Formaldehydeaniline	lb.	.31	
Formaldehyde-para-toluidine	lb.	.52	/ .54
Guantal	lb.	.40	/ .50
Hepteen	lb.	.35	/ .40
Base	lb.	1.35	/ 1.50
Hexamethylenetetramine U.S.P.	lb.	.47	
Technical	lb.	.36	
Lead oleate, No. 999	lb.	.12	
Witco	lb.	.15	
Monex	lb.	2.65	
Novex	lb.		
O. N. V.	lb.	$1.00	/$1.10
O-X-A-F	lb.	.50	/ .55
Ovac	lb.	.50	/ .55
Para-nitroso-dimethylaniline	lb.	.85	
Pentex	lb.	1.00	/ 1.10
Pip-Pip	lb.	2.50	
Pipsolene	lb.	1.55	/ 1.85
R-2	lb.	1.40	/ 1.80
Base	lb.	3.65	
R-23	lb.	.40	
R & H 50-D	lb.	.42	/ .43
Rotax	lb.	.60	/ .65
Safex	lb.	1.20	/ 1.30
Santocure	lb.	1.05	/ 1.30
Super-sulphur No. 1	lb.	.50	
2	lb.	.18	/ .20
Tetrone A	lb.	3.00	
Thiocarbanilide	lb.	.24	/ .30
Thionex	lb.	2.65	
Trimene	lb.	.55	/ .65
Base	lb.	1.05	/ 1.20
Triphenylguanidine (TPG)	lb.	.52	
Tuads	lb.	2.65	
Ureka	lb.	.60	/ .75
Blend B.	lb.	.60	/ .75
C	lb.	.56	/ .65
Vulcanex	lb.	.42	/ .43
Vulcanol	lb.	.85	
Z-B-X	lb.	2.50	
Z-88	lb.	.44	/ .60
P	lb.	.51	
Zenite	lb.	.46	/ .48
A	lb.	.53	/ .55
B	lb	.46	/ .48
Zimate	lb.	2.65	
Activator			
Barak	lb.	.50	
Age Resisters			
AgeRite Alba	lb	1.50	/ 2.10
Exel	lb.	1.00	/ 1.02
Gel	lb.	.57	/ .77
Hipar	lb.	.65	/ .67
Powder	lb.	.52	/ .73
Resin	lb.	.52	/ .73
D	lb.	.52	/ .73
White	lb.	1.25	/ 1.75
Albasan	lb.	.70	/ .75
Aminox	lb.	.52	/ .61
Antox	lb.	.56	
B-L-E	lb.	.52	/ .61
Powder	lb.	.65	/ .74
B-X-A	lb.	.55	/ .61
Copper Inhibitor X-872	lb.	1.15	
Flectol B	lb.	.52	/ .65
H	lb.	.52	/ .65
White	lb.	.90	/ 1.15
M-U-F	lb.	1.50	
Neozone (standard)	lb.	$0.63	
A	lb.	.52	/$0.54
B	lb.	.63	
C	lb.	.52	/ .54
D	lb.	.52	/ .54
E	lb.	.63	
Oxynone	lb.	.64	/ .80
Parazone	lb.	.68	
Perflectol	lb.	.65	/ .75
Permalux	lb.	1.20	
Santoflex A	lb.	.65	/ .75
B	lb.	.52	/ .65
Santowhite	lb.	.95	/ 1.20
Solux	lb.	1.30	
Thermoflex A	lb.	.65	/ .67
V-G-B	lb.	.52	/ .61
Alkalies			
Caustic soda, flake, Columbia (400 lb. drums)	100 lbs.	2.70	/ 3.35
liquid, 50%	100 lbs.	1.95	
solid (700 lb. drums)	100 lbs.	2.30	/ 3.10
Antiscorch Materials			
A-F-B	lb.	.35	/ .40
Antiscorch T	lb.	.90	
R-17 Resin (drums)	lb.	.10	
RM	lb.	1.25	
Retarder W	lb.	.36	
U.T.B.	lb.	.35	/ .60
Antisun Materials			
Heliozone	lb.	.27	
Sunproof	lb.	.27	/ .30
Colors			
BLACK			
Du Pont powder	lb.	.42	/ .44
Lampblack (commercial)	lb.	.13	
BLUE			
Brilliant	lb.		
Du Pont dispersed	lb.	.70	/ 3.60
Powders	lb	.45	/ 3.75
Prussian	lb.	.0375	
Toners	lb.	.08	/ 3.85
BROWN			
Mapico	lb.	.11	
GREEN			
Brilliant	lb.		
Chrome, light	lb.		
medium	lb.	.22	
oxide (freight allowed)	lb.		
Dark	lb.		
Du Pont dispersed	lb.	.87	/ 1.60
Powders	lb.	1.00	/ 2.00
Guignet's, Easton, Pa., bbls.	lb.	.70	
Light	lb.		
Toners	lb.	.85	/ 3.75

ORANGE
Du Pont dispersed ..... lb. $0.80 /$0.90
Powders ..... lb. .80 / 2.50
Lake ..... lb.
Toners ..... lb. .40 / 1.60

ORCHID
Toners ..... lb. 1.50 / 2.00

PINK
Toners ..... lb. 1.50 / 4.15

PURPLE
Permanent ..... lb.
Toners ..... lb. .60 / 2.10

RED
Antimony
Crimson, 15/17% ..... lb. .45
R. M. P. No. 3 ..... lb. .48
Sulphur free ..... lb. .50
R.M.P. ..... lb. .52
Golden 15/17% ..... lb. .28
7-A ..... lb. .37
Z-2 ..... lb. .23
Aristi ..... lb. 1.75
Cadmium, light (400 lb. bbls. ..... lb. .70 / .75
Chinese ..... lb.
Crimson ..... lb.
Du Pont dispersed ..... lb. .85 / 2.05
Powders ..... lb. .30 / 1.40
Mapico ..... lb. .0925
Medium ..... lb.
Rub-Er-Red, Easton, Pa., bbls. ..... lb. .0925
Scarlet ..... lb.
Toners ..... lb. .08 / 2.00

WHITE
Lithopone (bags) ..... lb. .04½/ .04¾
Albalith Black Label-11 .. lb. .04½/ .04¾
Astrolith ..... lb. .04½/ .04¾
Azolith ..... lb. .04½/ .04¾
Cryptone-19 ..... lb. .05¾/ .05¾
CB-21 ..... lb. .05¾/ .05¾
ZS No. 20 ..... lb. .08¾/ .08¾
86 ..... lb. .08¾/ .08¾
230 ..... lb. .08¾/ .08¾
Sunolith ..... lb. .04½/ .04¾
Ray-Bar ..... lb. .05¾/ .06¾
Ray-Cal ..... lb. .05¾/ .06¾
Rayox ..... lb. .15 / .18
Titanolith (5-ton lots) ..... lb. .05⅝/ .05⅞
Titanox-A (50-lb. bags) ..... lb. .15 / .1575
B (50-lb. bags) ..... lb. .05¾/ .05¾
30 (50-lb. bags) ..... lb. .05¾/ .05¾
C (50-lb. bags) ..... lb. .05¾/ .05¾
M ..... lb. .05¾/ .05¾
Ti-Tone ..... lb.
Zinc Oxide
Azo ZZZ-11 ..... lb. .0625/ .065
44 ..... lb. .0625/ .065
55 ..... lb. .0625/ .065
66 ..... lb. .0625/ .065
French Process, Florence
White Seal-7 (bbls.) ... lb. .085 / .0875
Green Seal-8 ..... lb. .08 / .0825
Red Seal-9 ..... lb. .075 / .0775
Kadox, Black Label-15 ... lb. .065 / .0675
No. 25 ..... lb. .075 / .0775
Red Label-17 ..... lb. .065 / .0675
Horse Head Special 3 ... lb. .0625/ .065
XX Red-4 ..... lb. .0625/ .065
23 ..... lb. .0625/ .065
72 ..... lb. .0625/ .065
78 ..... lb. .0625/ .065
80 ..... lb. .0625/ .065
103 ..... lb. .0625/ .065
110 ..... lb. .0625/ .065
St. Joe (lead free)
Black Label ..... lb. .0625/ .065
Green Label ..... lb. .0625/ .065
Red Label ..... lb. .0625/ .065
U.S.P. ..... lb. .095 / .0975
White Jack ..... lb. .08¾/ .08¾
Zopaque (bags) ..... lb. .15 / .1575

YELLOW
Cadmolith (cadmium yellow), 400 lb. bbls. ..... lb. .45 / .50
Du Pont dispersed ..... lb. 1.25 / 1.60
Powders ..... lb. .70 / 1.37
Lemon ..... lb.
Mapico ..... lb. .0675
Toners ..... lb. 2.50

Dispersing Agents

Darvan ..... lb. .30 / .50
Nevoll (drums) ..... lb. .0215
Santomerse S ..... lb. .11 / .25

Fillers, Inert

Asbestine, c.l., f.o.b., mills . ton 15.00
Barytes ..... ton 30.00 /36.00
f.o.b., St. Louis (50 lb. paper bags) ..... ton 22.85
off color, domestic ..... ton 20.00 /25.00
white, imported ..... ton 29.00 /32.00
Blanc fixe, dry, precip. .... lb. .03 / .035
Calcene ..... ton 37.50 /43.00
Infusorial earth ..... lb. .02 / .03
Kalite No. 1 ..... ton 24.00 /50.00
3 ..... ton 34.00 /60.00
Magnesia, calcined, heavy .. lb. .04
Carbonate, l.c.l. ..... lb. .07 / .095
Pyrax A ..... ton 7.50 /20.00
Whiting
Columbia Filler ..... ton 9.00 /14.00
Guilders ..... 100 lbs.
Hakuenka ..... lb.
Paris white, English cliff-stone ..... 100 lbs.
Southwark Brand, Commercial ..... 100 lbs.
All other grades ... 100 lbs.
Suprex, white extra light .. ton $45.00 /$60.00
heavy ..... ton 45.00 / 60.00
Witco, c.l. ..... ton 6.00

Finishes

Rubber lacquer, clear ..... gal.
colored ..... gal.
Starch, corn, pwd. .... 100 lbs.
potato ..... lb.
Talc ..... ton 25.00 /45.00

Flock

Cotton flock, dark ..... lb. .11 / .13
dyed ..... lb. .45 / .85
white ..... lb. .18 / .20
Rayon flock, colored ..... lb. 1.10 / 2.00
white ..... lb. .90

Latex Compounding Ingredients

Accelerator 85 ..... lb. .35
89 ..... lb. 1.40
122 ..... lb. 1.55
552 ..... lb. 2.50
Aerosol ..... lb. .45
Antox, Dispersed ..... lb. .42
Aquarex A ..... lb. .35
D ..... lb. .75
F ..... lb. .85
Areskap No. 50 ..... lb. .18 / .24
100, dry ..... lb. .39 / .51
Aresket No. 240 ..... lb. .16 / .22
300, dry ..... lb. .42 / .50
Aresklene No. 375 ..... lb. .35 / .50
400, dry ..... lb. .51 / .65
Black No. 25, Dispersed ... lb. .22 / .40
Catalpo ..... ton
Collocarb ..... lb. .055 / .07
Color Pastes, dispersed ..... lb. .35 / 1.75
Dispersex No. 15 ..... lb. .11 / .12
No. 20 ..... lb. .08 / .10
Emo, brown ..... lb. .15
white ..... lb. .15
Factice Compound, Dispersed ..... lb. .36
Heliozone, Dispersed ..... lb. .25
Igepon A ..... lb.
MICRONEX, Colloidal .... lb. .055 / .07
Nekal BX (dry) ..... lb.
Palmol ..... lb. .11
Pipsol X ..... lb. 3.05 / 3.55
R-23 ..... lb. .57
RN-2 ..... lb. 1.40 / 1.80
S.1 (400 lb. drums) ..... lb. .65
Santomerse D ..... lb. .41 / .65
S ..... lb. .11 / .25
No. 1 ..... lb. .18 / .35
No. 2 ..... lb. .18 / .35
No. 3 ..... lb. .40 / .65
Santovar A ..... lb. 1.15 / 1.40
Stablex A ..... lb. .90 / 1.10
B ..... lb. .65 / .90
C ..... lb. .40 / .50
Sulphur, Dispersed ..... lb. .10 / .15
No. 2 ..... lb. .075 / .15
T.1. (400 lb. drums) ..... lb. .40
Tepidone ..... lb. 1.55
Vulcan Colors ..... lb.
Zinc oxide, dispersed ..... lb. .12 / .15

Mineral Rubber

Black Diamond ..... ton 25.00
Genasco Hydrocarbon, granulated, (fact'y) ... ton
solid ..... ton
Gilsonite Hydrocarbon (factory) ..... ton
Hydrocarbon, hard ..... ton 22.00 /42.00
Parmr Grade 1 ..... ton 25.00 /27.00
2 ..... ton 25.00 /27.00
Pioneer ..... ton
285°-300° ..... lb. 22.00 /42.00

Mold Lubricants

Mold Paste ..... lb. .12 / .18
Sericite ..... ton 65.00 /75.00
Soapbark ..... lb.
Soapstone ..... ton 25.00 /35.00

Oil Resistant

AXF ..... lb. .40 / .45

Reenforcers

Carbon Black
Aerfloted Arrow Specification Black ..... lb. .0275/ .0625
Arrow Compact Granulized Carbon Black ..... lb. .0275/ .0625
"Certified" Heavy Compressed, Cabot ..... lb.
Spheron ..... lb.
Carbitum ..... ton 58.00 /63.00
Continental Dustless, c.l. . lb. .0275/ .0375
Compressed c.l. ..... lb. .0275/ .0375
Uncompressed, c.l. .... lb. .0275/ .0375
Disperso, c.l. ..... lb. .0275/ .0375
Dixie, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex. .... lb. .0275
c.l., delivered New York. lb. .0375
local stock, bags, delivered ..... lb. .0625
Dixiedensed, c.l., f.o.b., New Orleans, La., Galveston or Houston, Tex. .... lb. $0.0275
c.l., delivered New York. lb. .0375
local stock, bags, delivered ..... lb. .0625
Dixiedensed 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex. ..... lb. .0275
c.l., delivered New York. lb. .0375
local stock, bags, delivered ..... lb. .0625
Excello, c.l., f.o.b. Gulf ports ..... lb. .0275/$0.0475
delivered New York ... lb. .0375/ .0575
l.c.l., delivered New York ..... lb. .0625/ .07
Fumonex, c.l., f.o.b. works. lb. .03
ex-warehouse ..... lb. .05
Gastex ..... lb. .03 / .07
Kosmobile, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex. .... lb. .0275
c.l., delivered New York. lb. .0375
local stock, bags, delivered ..... lb. .0625
Kosmobile 66, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex. ..... lb. .0275
c.l., delivered New York. lb. .0375
local stock, bags, delivered ..... lb. .0625
Kosmos, c.l., f.o.b. New Orleans, La., Galveston or Houston, Tex. .... lb. .0275
c.l., delivered New York. lb. .0375
local stock, bags, delivered ..... lb. .0625
MICRONEX Beads, c.l., f.o.b. Gulf ports ... lb. .0275
c.l., delivered, New York ..... lb. .0375
local stock, bags, delivered ..... lb. .0625
Mark II, c.l., f.o.b. Gulf ports ..... lb. .0275
c.l., delivered, New York ..... lb. .0375
local stock, bags, delivered ..... lb. .0625
Standard, c.l., f.o.b. Gulf ports ..... lb. .0275
c.l., delivered, New York ..... lb. .0375
local stock, bags, delivered ..... lb. .0625
W-5, c.l., f.o.b., Gulf ports ..... lb. .0275
c.l., delivered, New York ..... lb. .0375
local stock, bags, delivered ..... lb. .0625
W-6, c.l., f.o.b., Gulf ports ..... lb. .0275
c.l., delivered, New York ..... lb. .0375
local stock, bags, delivered ..... lb. .0625
Paradene No. 2 (drums) . lb. .04
Pelletex ..... lb. .03 / .07
Supreme, c.l., f.o.b. Gulf ports ..... lb. .0275/ .0475
delivered New York ... lb. .0375/ .0575
l.c.l. delivered New York ..... lb. .0625/ .07
"WYEX BLACK" ..... lb. .0275/ .0625

Clays

Aerfloted Paragon (50 lb. bags) ..... ton 9.50 /22.00
Suprex (50 lb. bags) .. ton 9.50 /22.00
China ..... ton 17.50 /20.00
Crown, f.o.b. (plant) .... ton 9.50
Dixie ..... ton 11.00 /30.00
Junior ..... ton 9.50 /29.00
McNamee ..... ton 9.50 /22.00
Par ..... ton 9.50 /22.00
Witco, f.o.b. Works ..... ton 9.50
P-33 ..... lb. .0475/ .0775
Thermax ..... lb. .0175/ .05
Velvetex ..... lb. .022 / .035

Reodorants

Amora A ..... lb.
B ..... lb.
C ..... lb.
D ..... lb.
Curodex 19 ..... lb. 2.75
188 ..... lb. 3.50
198 ..... lb. 4.50
Rodo No. 0 ..... lb. 3.50 / 4.00
10 ..... lb. 4.50 / 5.00

Rubber Substitutes

Black ..... lb. .07 / .11
Brown ..... lb. .07 / .12
White ..... lb. .08 / .13
Factice
Amberex ..... lb. .19
Brown ..... lb. .07 / .11
Neophax A ..... lb. .1025
B ..... lb. .1025
Fac-Cel B ..... lb. .125
C ..... lb. .125
White ..... lb. .08 / .12

(Continued on page 78)

CUT TYRE COSTS

THE SUMMIT WAY

SAVES STEAM
REDUCES LABOUR
GIVES CORRECT CURE
LESS SPOILAGE
REDUCES HANDLING
MAKES EASY PLANNING
WITH CONTINUOUS MOLD PRODUCTION
WHICH MEANS

LOWER PRODUCTION COSTS

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FRANCIS SHAW & CO., LTD.
CORBETT STREET MANCHESTER II
ENGLAND

WRITE FOR THE SHAW SUMMIT UNIT VULCANIZER LEAFLET

Regular and Special Construotions
of
COTTON FABRICS

Single Filling Double Filling
and
ARMY
Ducks

HOSE and BELTING
Ducks

Drills

Selected
Osnaburgs

Curran & Barry
320 BROADWAY
NEW YORK

COTTON AND FABRICS

THE accompanying table of week-end closing prices on the New York Cotton Exchange shows the week-end change of representative futures covering the past two months.

The New York spot middling price closed at 8.29¢ per pound on October 1. The price rose sharply the first week, to close at 8.52¢ on October 10. Following this, the price varied within a narrow range until October 22, when the closing was at 8.68¢, 19 points higher for the week. The closing price on October 27 was 8.80¢ per pound.

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	Aug. 27	Sept. 24	Oct. 1	Oct. 8	Oct. 15	Oct. 22
Sept.	8.25	....	....	....	....	....
Oct.	8.30	7.82	8.03	8.16	....	....
Dec.	8.36	7.86	8.08	8.19	8.25	8.47
Mar.	8.36	7.88	8.04	8.12	8.16	8.40
July	8.32	7.86	7.97	8.00	7.94	8.16
Sept.	....	....	8.04	8.04	7.80	8.00

Sales at 13 southern markets totaled 577,526 bales during 15 days since October 1, against 807,985 bales for the same days one year ago.

On October 8 the Government Crop Reporting Board estimated the 1938 cotton crop at 12,212,000 bales, an increase of 387,000 bales from the September estimate.

Consumption of all cotton in domestic mills totaled 534,037 bales during September, against 561,406 in August and 601,305 in September, 1937, according to a report of the Census Bureau.

Fabrics

The demand for cotton textiles broadened considerably during the past month, and business at present is reported to be better than at any time since the early part of 1937. Large consumers are making provisions for their forward requirements, and, as a result of current activity, mill inventory positions are being improved. With the fall raincoat season in full swing and with interest in spring fabrics in evidence, raincoat manufacturers report business as being at a satisfactory level.

The market remains generally steady, and prices continue at last month's levels with the exception of tire fabrics which declined 1¢ per pound and a few minor changes in other groups. If present favorable conditions hold, a slowly rising market is anticipated.

New York Quotations

October 27, 1938

Drills		
38-inch 2.00-yard	yd.	$0.10¼
40-inch 3.47-yard		.06¾
50-inch 1.52-yard		.14½
52-inch 1.85-yard		.11¾
52-inch 1.90-yard		.11¾
52-inch 2.20-yard		.10¾
52-inch 2.50-yard		.09
59-inch 1.85-yard		.11½
Ducks		
38-inch 2.00-yard D. F.	yd.	.10½
40-inch 1.45-yard S. F.		.14¾
51½-inch 1.35-yard D. F.		.15⅝
72-inch 1.05-yard D. F.		.21½/.22
72-inch 17.21-ounce		.23¾
Mechanicals		
Hose and belting	lb.	.25
Tennis		
52-inch 1.35-yard	yd.	.16¼
Hollands		
Gold Seal and Eagle		
20-inch No. 72	yd.	.09
30-inch No. 72		.16
40-inch No. 72		.18
Red Seal and Cardinal		
20-inch	yd.	.07½
30-inch		.13¾
40-inch		.15
50-inch		.24
Osnaburgs		
40-inch 2.34-yard	yd.	.09
40-inch 2.48-yard		.08½
40-inch 2.56-yard		.08
40-inch 3.00-yard		.07¼
40-inch 7-ounce part waste		.06¾
40-inch 10-ounce part waste		.09¼
37-inch 2.42-yard		.08¾
Raincoat Fabrics		
Cotton		
Bombazine 60 x 64	yd.	.07½
Plaids 60 x 48		.09¾
Surface prints 60 x 64		.11
Print cloth, 38½-inch, 60 x 64		.04½
Sheetings, 40-inch		
48 x 48, 2.50-yard	yd.	.07
64 x 68, 3.15-yard		.06¾
56 x 60, 3.60-yard		.05⅞
44 x 40, 4.25-yard		.04½
Sheetings, 36-inch		
48 x 48, 5.00-yard	yd.	.04¼
44 x 40, 6.15-yard		.03¾
Tire Fabrics		
Builder		
17¼ ounce 60" 23/11 ply Karded peeler	lb.	.27
Chafer		
14 ounce 60" 20/8 ply Karded peeler	lb.	.27
9¼ ounce 60" 10/2 ply Karded peeler	lb.	.26
Cord Fabrics		
23/5/3 Karded peeler, 1 1/16" cotton	lb.	.28
15/3/3 Karded peeler, 1 1/16" cotton	lb.	.26
23/5/3 Karded peeler, 1¼" cotton	lb.	.33½
23/5/3 Combed Egyptian	lb.	.47
Lens Breaker		
8¼ ounce and 10¼ ounce 60" Karded peeler	lb.	.29

New York Outside Market

The outside market ruled generally quiet during the past month. Shipment offerings from the Far East were for the most part too high for acceptance in the local market, and owing to higher prices factories were hesitant in buying rubber, although some business was done when prices eased slightly toward the end of the month. After closing at 16 11/16¢ per pound on October 1, the price of No. 1 ribbed smoked sheets advanced to close at 17 3/16¢ per pound on October 10, after which it eased somewhat to close at 16 7/8¢ per pound on October 22. The closing price on October 27 was 16 11/16¢ per pound.

The week-end closing prices on No. 1 ribbed smoked sheets follow: October 1, 16 11/16¢; October 8, 17 3/16¢; October 15, 17⅛¢; and October 22, 16 7/8¢.

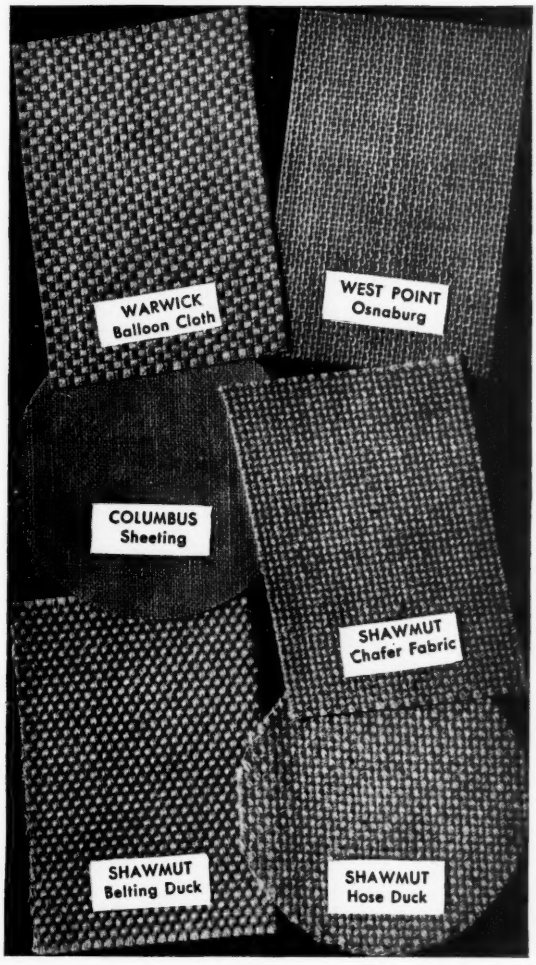
New York Quotations

(Continued from page 76)

Softeners		
Bondogen	lb.	$0.98 /$1.65
Burgundy pitch	lb.	.06
Cycline oil	gal.	.14 / .20
Nuba resinous pitch (drums)		
Grades No. 1 and No. 2	lb.	.03
Grade No. 3	lb.	.04
Palm oil (Witco), c.l.	lb.	.0575
Pine tar	gal.	
Plastogen	lb.	.0775/ .125
R-19 Resin (drums)	lb.	.10
R-21 Resin (drums)	lb.	.10
Reogen	lb.	.115 / .30
Rosin oil, compounded	gal.	.40
RPA No. 1	lb.	.65
2	lb.	.65
Rubtack	lb.	.10
Tackol	lb.	.085 / .18
Tonox D	lb.	.75 / .85
Witco No. 20	gal.	.20
X-1 Resinous oil (tank car)	lb.	.01
Solvents		
Beta-Trichlorethane	gal.	
Carbon bisulphide	lb.	
tetrachloride	lb.	
Industrial 90% benzol (tank car)	gal.	.16
Skellysolve	gal.	
Stabilizers for Cure		
Laurex, ton lots	lb.	.12 / .14
Stearex B	lb.	.105 / .115
Beads	lb.	.088 / .098
Stearic acid, single pressed	lb.	.105 / .115
Stearite	100 lbs.	8.80
Zinc stearate	lb.	.23
Synthetic Rubber		
Neoprene Type E	lb.	.65
G	lb.	.70
H	lb.	.78
M	lb.	.65
Latex Type 57	lb.	.30
"Thiokol" A	lb.	.30
Coating materials	gal.	2.50 / 5.00
DX	lb.	.45
Molding Powder	lb.	.61 / .71
Varnish		
Shoe	gal.	1.45
Vulcanizing Ingredients		
Sulphur		
Chloride, drums	lb.	.035 / .04
Rubber	100 lbs.	2.65
Telloy	lb.	1.75 / 2.00
Vandex	lb.	1.75 / 2.00
(See also Colors—Antimony)		
Waxes		
Carnauba, No. 3 chalky	lb.	.37¼
2 N.C.	lb.	.39½
3 N.C.	lb.	.37¼
1 Yellow	lb.	.4575
2	lb.	.4425
Montan, crude	lb.	.11

Labor Force Increases

Because there is an average addition to the total labor force of about 621,000 persons annually, the unemployment problem would not be solved even if present employment levels were as high as in 1929, according to a recent study by the Statistical Division of the National Industrial Conference Board. Why does the labor force increase? Immigrants, young people who arrive at working age, other young men and women who complete their formal education, and women who enter industry are among those constantly joining the ranks of workers. Emigration, death, retirement, physical disability, and other causes cut down the labor force, but the inflow exceeds the outflow by over a million workers every two years.



OUR FABRIC IS THE KEYSTONE

of a good many rubber products

And knowing this, it's natural that we're watching production day in and day out to be sure that the fabrics we make and sell are as consistent in construction and performance as it is possible to make them. Chemically as well as physically, we work to the requirements of the rubber engineer. In our process of manufacturing, we are particularly careful to avoid using any substances which would be injurious in rubber processing. In addition to usual fabric constructions, we are extremely interested to cooperate with rubber engineers in developing fabrics to meet special specifications.

WELLINGTON SEARS COMPANY

65 Worth Street, New York, N. Y.

BOSTON CHICAGO DETROIT PHILADELPHIA ATLANTA ST. LOUIS NEW ORLEANS LOS ANGELES SAN FRANCISCO

IMPORTS, CONSUMPTION, AND STOCKS

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Imports* Tons	U. S. Consumption¶ Tons	U. S. Stocks Mfgrs. Importers, Dealers, Etc.† Tons	U. S. Stocks Afloat† Tons	U. K.—Public Warehouses, London Liverpool†‡ Tons	Singapore and Penang Dealers and Port Stocks†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1936	490,858	575,000	223,000	56,567	78,462	26,969	855,600	1,044,195	538,028
1937	584,851	543,600	262,204	63,099	57,785	44,792	1,135.337	1,098,760	639,025
1938									
January	42,135	29,429	274,581	57,356	62,108	48,494	80,372	**70.591	a634,330
February	43,930	23,868	294,338	47,459	71,516	46,241	81,008	61,129	a653,791
March	35,967	30,487	299,172	41,882	76,617	50,797	81,172	78,732	a670,332
April	30,807	27,984	301,436	39,071	82,754	40,614	86,725	70,700	a668,440
May	27,410	28,947	299,720	32,859	87,215	40,598	64,406	77,302	a653,865
June	26,011	30,629	294,566	32,079	92,312	44,729	70,873	69,963	a670,068
July	22,918	32,209	284,914	40,400	95,252	45,529	81,307	73,863	a670,807
Aug.	31,099	38,170	277,463	47,772	99,614	41,002	74.193	78,184	.....
Sept.	37,374	37,823	276,586	48,927	.....	.....	.....	.....	.....

*Including liquid latex. †Stocks on hand the last of the month or year. ‡Statistical Bulletin of the International Rubber Regulation Committee. §Stocks at U. S. A., U. K., Singapore and Penang, Para, Manaos, regulated areas, and afloat. ¶Corrected to 100% from estimate of reported coverage. **Not including additional absorption from U.K. manufacturers' stocks for any month during 1937. The figure will be included in yearly total. aJapan stocks not included.

RECLAIMED RUBBER

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption†	Consumption % to Crude	U. S. Stocks*	Exports
1936	150,571	141,486	24.6	19,000	7,085
1937	185,033	162,000	29.8	28,800	13.233
1938					
Jan.	7,698	6,940	23.6	28,900	658
Feb.	6,198	7,141	29.9	27,487	470
Mar.	6,875	8,471	27.8	25,432	459
Apr.	6,399	7,480	26.7	23,339	426
May	6,866	8,009	27.7	22,275	550
June	7,584	8,274	27.0	21,040	658
July	7,109	8,273	25.7	18,832	720
Aug.	10,472	10,732	28.1	17,892	557
Sept.	12,016	11,281	29.8	18,127	...

*Stocks on hand the last of the month or year. †Corrected to 100% from estimate of reported coverage. *Compiled by The Rubber Manufacturers Association, Inc.*

RUBBER SCRAP

WITH reclaimers increasing their activity, the demand for scrap rubber continued to improve during October. Tire grades were in the greatest demand, with inner tubes showing substantial improvement toward the latter part of the month.

Prices eased somewhat further after our last report and then strengthened under the influence of better demand. In comparison with quotations of one month ago, mixed auto tires and mixed and white mechanicals advanced; black auto peelings and all grades of tubes with the exception of No. 1 floating receded somewhat; other grades showed no change.

IF AN ACCIDENT OCCURS WHILE YOUR CAR IS traveling under 40 MILES AN HOUR there is only ONE CHANCE IN 44 that someone will be killed. . . . But—if an accident occurs while your car is traveling over 40 MILES AN HOUR there is ONE CHANCE IN 19 that someone will be killed. . . . Death begins at 40! *Industrial Accident Prevention Association.*

CONSUMERS' BUYING PRICES

(Carload Lots Delivered Eastern Mills)

October 22, 1938

		Prices
Boots and Shoes		
Boots and shoes, black	lb.	$0.01 /$0.01⅛
Colored	lb.	.00¾/ .00⅞
Untrimmed arctics	lb.	.00¾/ .00⅞
Inner Tubes		
No. 1, floating	lb.	.08 / .08½
No. 2, compound	lb.	.03⅝/ .03¾
Red	lb.	.03½/ .03⅝
Mixed tubes	lb.	.03¾/ .03⅞
Tires (Akron District)		
Pneumatic Standard		
Mixed auto tires with beads	ton	10.50 /11.00
Beadless	ton	14.00 /14.50
Auto tire carcass	ton	17.00 /18.00
Black auto peelings	ton	16.00 /17.00
Solid		
Clean mixed truck	ton	22.50 /25.00
Light gravity	ton	29.00 /32.00
Mechanicals		
Mixed black scrap	ton	15.00 /18.00
Hose, air brake	ton	18.00 /19.00
Garden, rubber covered	ton	10.00 /11.00
Steam and water, soft	ton	10.00 /10.50
No. 1 red	lb.	.02¾/ .03
No. 2 red	lb.	.01¾/ .02
White druggists' sundries	lb.	.03½/ .03¾
Mixed mechanicals	lb.	.02¾/ .02½
White mechanicals	lb.	.03½/ .03¾
Hard Rubber		
No. 1 hard rubber	lb.	.10 / .11

CRUDE rubber consumption by United States manufacturers during September is estimated at 37,823 long tons, against 38,170 long tons during August, a decrease of less than 1%, and 13.93% under the 43,945 (revised) long tons consumed in September, 1937, according to R.M.A. statistics.

Gross imports of crude rubber for September are reported to be 37,374 long tons, 20.2% over the August figure of 31,099 long tons, but 33.3% under the 56,0149 long tons imported in September, 1937.

Total domestic stocks of crude rubber on hand September 30 are estimated at 276,586 long tons, compared with August 31 stocks of 277,463 long tons and 186,193 long tons on hand September 30, 1937.

Crude rubber afloat to United States ports as of September 30 is said to be 48,927 long tons, against 47,772 long tons afloat on August 31 and 83,288 long tons asoat on September 30, 1937.

London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
October 1	63,321	34,682
October 8	63,079	34,740
October 15	62,829	34,448
October 22	62,583	33,996

ACCORDING to R.M.A. statistics, September reclaimed rubber consumption is estimated at 11,281 long tons, 7.7% greater than in August; production at 12,016 long tons; and stocks on hand September 30, 18,127 long tons. The slight increase in stocks was more than compensated for by the increased rate of consumption. Following earlier predictions, demand during October showed a further definite increase over the preceding month, and it is expected that this improved rate of activity will be sustained over the balance of the year. Better demand is reported as coming from all leading reclaim consumption channels.

The market is steady with prices of all grades of reclaim continuing at last month's quotations. The present price structure is felt to be favorable in view of the rising demands.

New York Quotations

October 24, 1938

Auto Tire	Sp. Grav.	¢ per lb.
Black Select	1.16-1.18	6 / 6¼
Acid	1.18-1.22	6¾/ 7
Shoe		
Standard	1.56-1.60	6½/ 6¾
Tubes		
No. 1 Floating	1.00	12 /12¼
Compound	1.10-1.20	8 / 8¼
Red Tube	1.15-1.30	8 / 8¼
Miscellaneous		
Mechanical Blends	1.25-1.50	4¾/ 5
White	1.35-1.50	11½/12

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Editor's Book Table

NEW PUBLICATIONS

"Mapico Colors." Magnetic Pigment Co., 41 E. 42nd St., New York, N. Y. 28 pages. This booklet, devoted to Mapico color pigments, pure oxides of iron made by the precipitation process, consists of a series of spirally-bound color cards, comprising 22 shades of four colors: black, yellow, red, and brown. Data are given on hiding power, specific gravity, bulking value, approximate analysis, and viscosity in oil. The booklet also contains supplementary descriptive information on these pigments.

"Truck, Bus, and Tractor Operators Handbook." 1938 Edition. The B. F. Goodrich Co., Akron, O. 68 pages. As in previous editions, this year's handbook contains descriptive information and specification tables on Goodrich tires for commercial service. In addition the Goodrich Calculator for truck tire costs and sizes is described, and there is a section on load analysis with tables on load ratings and inflation pressures. The book is completed with a table on rims and dual spacings for different-size truck and bus tires and a table of weights and measures of materials commonly transported by trucks.

"Rubber Plumbing Specialties." Catalog 39. The Williams-Bowman Rubber Co., Cicero, Ill. 44 pages. In this illustrated catalog are complete data including descriptions, list prices, weights, and other pertinent information on the firm's line of rubber plumbing specialties, rubber covered rolls, slab rubber, extruded rubber parts, special molded items, etc. A detailed index completes the booklet.

"Tag Indicating Controller." C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., Brooklyn, N. Y. 4 pages. This bulletin, No. 1175, supplementary to catalog 1060D, describes the firm's new direct-set indicating controllers, Model No. 9-TIC for temperature and No. 9-PIC for pressure. In addition to descriptive material, illustrations and complete specifications are given.

"List o' Trades and How to Reach 'em." W. S. Ponton, Inc., 635 Sixth Ave., New York, N. Y. 132 pages. This mailing-list catalog gives in alphabetical order approximate counts and costs of over 9,000 mailing lists for the principal business and professional classifications in the United States. In addition there are state counts of principal trades and professions, and special mailing lists for the New York area are tabulated.

"Robertson Engineered Hydraulic Pump." John Robertson Co., Dept. C, 133 Water St., Brooklyn, N. Y. 4 pages. This folder presents factual and descriptive information of the firm's high-pressure Hydraulic pumps. Fourteen construction features are enumerated, and the bulletin incorporates a complete reference table of general dimensions and specifications.

"List of Inspected Appliances Relating to Accident Hazard—Automotive Equipment—Burglary Protection." September, 1938. Underwriters Laboratories, Inc., Chicago, Ill. 72 pages. This revised list covers devices, materials, and systems which have been inspected for accident hazards, for use on automotive vehicles, and for protection against burglary.

"Sixty Years of Electrical Progress." General Electric Co., Schenectady, N. Y. 8 pages. This leaflet reviews briefly progress in this country since the inception of the company 60 years ago, pointing out that improvement of the standard of living has followed closely the increase in the use of electricity. Growth statistics of the firm and a review of employe plans are also included.

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Trafalgar Sq., London, W.C.2, England, gives the following figures for September, 1938:

Rubber Exports: Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

To	Sheet and Crepe Rubber Tons	Latex, Concentrated Latex, Revertex, and Other Forms of Latex Tons
United Kingdom	4,748	344
United States	18,417	490
Continent of Europe	9,796	253
British possessions	4,539	92
Japan	1,376	16
Other countries	915	6
Totals	39,791	1,201

Rubber Imports: Actual, by Land and Sea

From	Dry Rubber Tons	Wet Rubber (Dry Weight) Tons
Sumatra	3,161	51
Dutch Borneo	1,449	3
Java and other Dutch Islands	185	..
Sarawak	745	..
British Borneo	160	5
Burma	167	4
Siam	2,702	839
French Indo-China	828	206
Other countries	81	..
Totals	9,478	1,108

"Modern Plastics' Catalog-Directory." *Modern Plastics,* 122 E. 42nd New York, N. Y. 304 pages. The October issue of this publication devoted to the plastics field appears for the third consecutive year in the form of a handbook, catalog, and directory. Containing 46 authoritative articles this reference work points out the major developments of the past year relating to materials, methods, and equipment. Brief progress reports from authorities abroad together with a similar American report present a survey of world progress in this fast-growing field. A properties chart, revised and approved by engineers and chemists of nearly 50 companies, offers a vast amount of condensed, comparative data on plastics. A buyers' and trade name directory is included with an alphabetical list of manufacturers and addresses.

"Functions of the Sales Executive." Policyholders Service Bureau, Metropolitan Life Insurance Co., One Madison Avenue, New York, N. Y. 64 pages. This report, which offers an interpretation of the function and the responsibilities of the sales executive, is based upon a survey of the practices and experiences of 120 manufacturing concerns. The scope of the sales management function is discussed under four general divisions: the sales program; the product; the market and other "outside" factors; and the sales organization. One section of the report discusses the duties of sales executives under various types of organization set-ups and is illustrated by case studies. Another analyzes the way in which the sales manager spends his time. Others deal with the assignment and delegation of functions within the sales department, the nature and amount of field work done by sales executives, and the coordination of sales with other phases of the business. Many important trends in the field of sales management were brought out in the course of this investigation.

"A Handbook of White Pigments." Second Edition. Krebs Pigment & Color Corp., Wilmington, Del. 40 pages. Because of recent developments in the firm's line of white pigments this revised handbook was recently published. The pigments, which may be divided into three classes, lithopones, pure titanium dioxide, and extended titanium pigments, are briefly described, and information is given regarding their field of use, consistency, and physical and chemical characteristics.

BOOK REVIEWS

"Chemical Engineering Catalog." Twenty-third Annual Edition, 1938. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. Cloth, 1,034 pages, 8¼ by 11 inches. Illustrated. Index.

The latest edition of this standard reference work for the process industries contains information of several hundred concerns manufacturing engineering equipment and supplies for chemical and related industries including rubber. An innovation in this year's issue is the inclusion of 16 pages devoted to the publication of certain useful nomographs and charts which have been supplied by various commercial firms and educational and research institutions. The volume comprises the following sections: Company Index; Trade Name Index; Equipment and Supplies—Classified Index, Technical Data Section, and Manufacturers' Catalogs; Chemicals and Raw Materials—Classified Indexes of Industrial, Laboratory, and Reagent Chemicals, and Manufacturers' Catalogs; and Technical and Scientific Books Section.

"1937 Bibliography of Rubber Literature (Excluding Patents)." Compiled by Donald E. Cable, Technical Librarian, General Laboratories, United States Rubber Products, Inc., Passaic, N. J. Published by *The Rubber Age*, 250 W. 57th St., New York, N. Y. 1938. Paper or cloth, 6 by 9 inches, 128 pages. Subject and author indexes. Price $1, paper; $2, cloth.

This is the third of a series of annual bibliographies designed to assemble under one cover a collection of rubber references with suitable directions to enable the reader to find the original articles. The book opens with a list of journal abbreviations followed by the complete title, publisher, and address. The bibliography itself is divided into 75 distinct sections classified according to subject matter. This edition continues the letter-number combination method of identifying references as used in the two earlier editions. The book is completed with adequate author and subject indexes.

"Chemical Tables from Handbook of Chemistry and Physics." Charles D. Hodgman, Editor-in-Chief. Published by Chemical Rubber Publishing Co., Cleveland, O. 1938. Fabrikoid, 5 by 7¼ inches, 1416 pages. Index. Price $2.50.

In answer to numerous requests for a separate book of chemical tables taken from the widely-known "Handbook of Chemistry and Physics" this volume has been published. The new book includes all material of the handbook which is of direct and particular interest to chemists, together with a generous selection of the more valuable tables of general character and features of especial usefulness. Thus, while much of the material on sound, electricity, magnetism, and optics is necessarily omitted, data on electrochemistry index of refraction, and emission spectra are included. In addition to the handbook data, several new tables have been added, including: Melting Point Index of Organic Compounds; Boiling Point Index of Organic Compounds; Potentials of Electrochemical Reactions at 25° C.; Free Energy; Electrochemical Equivalents of the Elements; and Ionization Potentials. Extensive revisions have been made in the following sections: Isotopes; Calibration Tables for Thermocouples; Definitions of Chemical Terms; and Plate and Film Speeds. The page size of the new volume is somewhat larger than the handbook, allowing ample margins and a more convenient arrangement of material.

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(*Advertisements continued on page* 85)

Rubber Goods Production Statistics

Tires and Tubes		1938 July	1937 July
Pneumatic casings			
Production	thousands	3,353	4,292
Shipments, total	thousands	3,947	5,190
Domestic	thousands	*	5,112
Stocks, end of month	thousands	8,201	11,654
Inner Tubes			
Production	thousands	2,784	4,019
Shipments, total	thousands	3,357	5,046
Domestic	thousands	*	4,993
Stocks, end of month	thousands	7,512	10,869
Raw material consumed			
Fabrics	thous. of lbs.	....	18,494
Miscellaneous Products			
Single and double texture proofed fabrics			
Production	thous. of yds.	3,100	3,380
Rubber and canvas footwear			
Production, total	thous. of prs.	2,719	4,679
Tennis	thous. of prs.	*	1,584
Waterproof	thous. of prs.	*	3,095
Shipments, total	thous. of prs.	4,041	5,764
Tennis	thous. of prs.	*	2,075
Waterproof	thous. of prs.	*	3,689
Shipments, domestic, total	thous. of prs.	*	5,738
Tennis	thous. of prs.	*	2,055
Waterproof	thous. of prs.	*	3,683
Stocks, total, end of month	thous. of prs.	19,469	21,729
Tennis	thous. of prs.	*	4,404
Waterproof	thous. of prs.	*	17,326

*Data no longer available.

The above figures have been adjusted to represent 100% of the industry based on reports received which represented 81% for 1936-37.

Source: *Survey of Current Business*, Bureau of Foreign & Domestic Commerce, Washington, D. C.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

No.	Commodity	City and Country
‡7,889	Automobile accessories	Oslo, Norway
*7,896	Sporting goods	Rangoon, Burma
*7,900	Rubber goods	Ixelles, Belgium
*7,904	Automobile accessories and parts	Manila, Philippine Islands
‡7,907	Rubber goods manufacturing machinery and crude rubber	Melbourne, Australia
*7,914	Tires and inner tubes	Panama City, Panama
*7,917	Gloves and rubber preservatives	Tel-Aviv, Palestine
‡7,920	Sporting goods	Brussels, Belgium
†7,922	Fountain pens	Lourenco Marques, Portuguese East Africa
*7,929	Elastic girdles and elastic piece goods	Athens, Greece
†7,944	Office supplies	Vieux-Dieu, Belgium
†7,956	Semi-manufactured combs	Copenhagen, Denmark
†7,961	Carbon black, diorthotylguanidine, and diphenylguanidine	Antwerp, Belgium
*7,967	Automobile accessories and parts	Manila, Philippine Islands
*7,983	Tires and tubes	Habana, Cuba
*7,984	Balls, toys, and dolls	Brussels, Belgium
‡7,985	Toys	Brussels, Belgium
*7,998	Elastic	Toronto, Canada
†8,002	Novelties	London, England
*8,009	Office supplies	Caracas, Venezuela
‡8,010	Girdles	Brussels, Belgium
‡8,018	Boots	Lisbon, Portugal
†8,020	Golf equipment	London, England
*8,024	Sporting goods	Buenos Aires, Argentina
*8,030	Automobile accessories	Beirut, Syria
*8,087	Heels and soles	Alexandria, Egypt
*8,112	Scrap rubber	Hamburg, Germany
*8,115	Automobile accessories and parts	Buenos Aires, Argentina
*8,116	Automobile parts	Buenos Aires, Argentina
‡8,119	Carbon black	Brussels, Belgium
*8,120	Rubber chemicals	London, England

*Agency. †Purchase. ‡Purchase and agency.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	9 Mos., 1938 No.	%	9 Mos., 1937 No.	%
Drop Center Rims, 16" Diameter and Under				
16x4.00D	7,046	0.1	11,098	0.1
16x4.25D	.....	...	277,238	1.5
16x4.50D	5,957	0.1	.....	...
15x3.00D	45,808	0.8	.....	...
15x3.50D	46	0.0	.....	...
15x5.00F	15,211	0.3	931	0.0
15x5.50F	66.557	1.1	217,196	0.1
16x3.50D	181.672	3.1	1,479,722	8.5
16x4.00E	2,500,103	43.4	7,117,358	40.8
16x4.25E	102,176	1.8	928,849	5.3
16x4.50E	748.975	13.0	2,760,085	15.8
16x5.00F	419,665	7.3	898,622	5.1
16x5.50F	59,302	1.0	132,921	0.8
16x6.00F	16,958	0.3	21,198	0.1
Semi Drop Base Rims, 16" Diameter				
16x4.50E	7,223	0.1	.....	...
16x5.50F	30.357	0.5	.....	...
Drop Center Rims, 17" Diameter and Over				
17x3.00D	719	0.0	5,785	0.0
17x3.25E	3,559	0.1	44,165	0.3
17x3.62F	.....	...	38,729	0.2
17x4.00F	.....	...	356	0.0
17x4.19F	.....	...	959	0.0
17x5.00F	167	0.0	5,745	0.0
18x2.15B	18,445	0.3	25,451	0.1
18x3.00D	3.002	0.1	4,312	0.0
18x3.25E	2,089	0.0	8,968	0.0
18x3.62F	11,236	0.2	40,747	0.2
18x4.00F	.....	...	4,760	0.0
18x4.19F	7,662	0.1	21,109	0.1
19x2.15B	1.099	0.0	1,405	0.0
19x3.00D	.....	...	2,703	0.0
19x3.25E	248	0.0	701	0.0
19x3.62F	.....	...	6,537	0.0
20x3.25E	3,425	0.1	12,963	0.1
20x3.62F	2.662	0.0	.....	...
21x3.00D	962	0.0	.....	...
21x3.25E	5,157	0.1	15,613	0.1
22x3.25E	3,108	0.1	986	0.0
Flat Base Rims, Passenger				
All Sizes	3,523	0.1	24,059	0.1
High Pressure Rims, Passenger				
All Sizes	232	0.0	1,120	0.0
Clincher Rims				
All Sizes	.....	...	4,720	0.0
15" Truck and Bus Rims				
15x5	144	0.0	.....	...
15x7	3,056	0.1	4,354	0.0
15x8	1,660	0.0	2,052	0.0
15x9/10	15	0.0	.....	...
17" Truck and Bus Rims				
17x5	45,854	0.8	.....	...
17x6	30,798	0.5	25,203	0.1
18" Truck and Bus Rims				
18x5	59	0.0	.....	...
18x6	3,368	0.1	6,813	0.0
18x7	11,059	0.2	39,992	0.2
18x8	13,005	0.2	6,175	0.2
18x9/10	2,192	0.0	6,022	0.0
20" Truck and Bus Rims				
20x5	227,238	4.0	838,553	4.8
20x6	554,295	9.6	1,375,937	7.9
20x7	167,425	2.9	386,336	2.2
20x8	49,256	0.9	156,152	0.9
20x9/10	11,083	0.2	25,653	0.1
20x11	2,622	0.0	2,558	0.0
22" Truck and Bus Rims				
22x7	225	0.0	257	0.0
22x8	8,091	0.1	15,976	0.1
22x9/10	2,511	0.0	5,389	0.0
24" Truck and Bus Rims				
24x5	.....	...	101	0.0
24x6	1,270	0.0	3,896	0.0
24x7	1,555	0.0	5,408	0.0
24x8	3,876	0.1	12,025	0.1
24x9/10	5,686	0.1	13,139	0.1
24x11	2,895	0.1	3,121	0.0
Tractor and Implement Rims				
12x2.50C	16	0.0	.....	...
12x3.00D	4,197	0.1	4,495	0.0
13x5.50F	514	0.0	.....	...
15x3.00D	41,123	0.7	78,570	0.5
16x3.00D	1,147	0.0	355	0.0
16x6.00F	8,996	0.1	.....	...
18x3.00D	910	0.0	652	0.0
18x5.50F	10,105	0.2	5,713	0.0
19x3.00D	.....	...	307	0.0
20x4.50E	4,123	0.1	10,014	0.1
20x5.00F	2,262	0.0	.....	...
20x5.50F	7,673	0.1	5,359	0.0
21x3.00D	675	0.0	3,041	0.0
22x4.50E	6,464	0.1	1,336	0.0
24x3.00D	13	0.0	.....	...
28x4.00D	44	0.0	28	0.0
36x3.00D	852	0.0	1,303	0.0
36x4.50E	359	0.0	1,520	0.0
40x3.00D	61	0.0	.....	...
40x4.00 E	70	0.0	.....	...
40x4.50E	96	0.0	17	0.0
40x5.50F	27	0.0	.....	...
44x4.00E	5	0.0	.....	...
24x5.50R	29,242	0.5	.....	...
32x5.50R	268	0.0	.....	...
36x5.50R	4,870	0.1	.....	...
40x5.50R	6,537	0.1	.....	...
20x8.00T	944	0.0	.....	...
24x6.00S	3,975	0.1	16,970	0.1
24x8.00T	55,091	1.0	56,366	0.3
28x6.00S	3,583	0.1	2,302	0.0
Tractor and Implement Rims (*Cont'd*)				
28x8.00T	25,174	0.4	59,608	0.3
32x8.00T	7,036	0.1	7,839	0.0
36x6.00S	36,711	0.6	53.326	0.3
36x8.00T	52.393	0.9	43,951	0.2
40x6.00S	16,054	0.3	16,941	0.1
40x8.00T	1,064	0.0	5	0.0
42x8.00T	510	0.0	416	0.0
44x8.00T	170	0.0	585	0.0
Cast Wheels				
10x5.00F	1,281	0.0	2,565	0.0
10x6.00F	405	0.0	1,052	0.0
15x2.50D	.....	...	166	0.0
24x15	302	0.0	381	0.0
Airplane Rims				
All Sizes	575	0.0	1,289	0.0
Totals	5,759,506		17,428,695	

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
2516	Manufacturer of rubber mats with inlaid names.
2517	Firm dipping wire goods, as clamp holders for lamps.
2518	Manufacturers of sponge rubber in the East.
2519	Manufacturers of equipment and supplies for making tennis balls.
2520	Exporters of retreaded tires.
2521	Manufacturer of rubber for making rubber stamps.
2522	Manufacturer of "Stick-Back" material for attaching rubber to metal.
2523	Supplier of latex rubber in sheet form.
2524	Supplier, in Midwest, of small quantities of Para crepe sheet.
2525	Supplier of sponge rubber for church kneeling benches.
2526	Manufacturer of time clocks for vulcanizer presses.
2527	Manufacturers of molded Bakelite articles and of Bakelite with a cloth insert.
2528	Manufacturer of waterproofed silk.

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Continued

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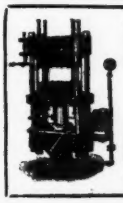

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Statement of "India Rubber World"

Statement of the ownership, management, circulation, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of India Rubber World, published monthly at New York, N. Y., for October 1, 1938.

State of New York } ss.
County of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared B. B. Wilson, who, having been duly sworn according to law, deposes and says that he is the Business Manager of India Rubber World and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: publisher, Bill Brothers Publishing Corp., 420 Lexington Ave., New York, N. Y.; editor, S. C. Stillwagon, 420 Lexington Ave., New York, N. Y.; managing editor, S. C. Stillwagon, 420 Lexington Ave., New York, N. Y.; business manager, B. B. Wilson, 420 Lexington Ave., New York, N. Y.

2. That the owner is: Bill Brothers Publishing Corp., Caroline L. Bill, Raymond Bill, Edward Lyman Bill, and Randolph Brown, all located at 420 Lexington Ave., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1% or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

B. Brittain Wilson,
Business Manager

Sworn to and subscribed before me this 30th day of September, 1938.

[seal]

Wm. A. Low.

Notary Public Queens Co. No. 1161. Reg. No. 4973. Certificate filed in N. Y. Co. No. 761. Reg. No. 9L464.

(Commission expires March 30, 1939)

Tire Production Statistics

	Pneumatic Casings		
	Inventory	Production	Shipments
1936	11,114,399	58,116,349	55,362,739
1937	10,767,799	55,284,415	55,466,329
1938			
Jan.	10,987,967	2,776,046	2,500,148
Feb.	10,833,036	2,238,167	2,359,098
Mar.	10,819,552	2,792,440	2,890,749
Apr.	10,316,774	2,737,235	3,272,875
May	9,855,360	2,723,524	3,405,036
June	8,762,674	3,109,170	4,066,918
July	8,201,415	3,352,601	3,947,431
Aug.	8,329,590	4,093,234	4,045,540
Sept.	8,406,261	3,970,397	3,943,486

	Inner Tubes		
	Inventory	Production	Shipments
1936	10,985,273	57,247,553	54,624,321
1937	10,235,517	51,986,167	52,376,657
1938			
Jan.	10,164,141	2,417,920	2,423,856
Feb.	10,161,093	2,132,013	2,127,260
Mar.	10,129,854	2,474,821	2,544,480
Apr.	9,524,959	2,199,116	2,781,908
May	9,010,245	2,260,841	2,889,799
June	8,107,626	2,717,316	3,629,224
July	7,511,679	2,784,418	3,356,929
Aug.	7,808,270	3,814,738	3,570,011
Sept.	7,907,109	3,863,025	3,615,201

Source: The Rubber Manufacturers Association, Inc. Figures adjusted to represent 100% of the industry.

U. S. Crude and Waste Rubber Imports for 1938

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Totals 1938	Totals 1937	Balata	Miscellaneous	Waste
Jan. ..... tons	39,744	1,259	411	177	6	538	42,135	32,820	41	526	8
Feb.	41,709	1,400	453	150	..	218	43,930	43,289	35	808	22
Mar.	34,252	861	371	278	..	205	35,967	52,039	37	555	93
Apr.	29,662	690	324	...	1	130	30,807	35,850	73	1,046	33
May	25,967	696	195	326	1	225	27,410	50,840	32	647	5
June	25,141	640	20	60	..	150	26,011	48,956	35	901	23
July	21,883	656	64	52	9	254	22,918	39,108	57	828	12
Aug.	29,560	880	170	170	..	319	31,099	48,785	84	649	14
Sept.	36,190	837	221	26	25	75	37,374	56,049	92	889	80
Total 9 mos., 1938 ..... tons	284,108	7,919	2,229	1,239	42	2,114	297,651	.....	486	6,849	290
Total 9 mos., 1937 ..... tons	383,274	16,567	4,780	928	98	2,089	.....	407,736	281	6,147	2,976

Compiled from The Rubber Manufacturers Association, Inc., statistics.

United States Latex Imports

Year	Pounds (d.r.c.)	Value
1936	44,469,504	$6,659,899
1937	51,934,040	10,213,670
1938		
Jan.	3,135,524	494,242
Feb.	3,772,897	560,883
Mar.	2,192,459	327,844
Apr.	1,991,943	295,690
May	1,968,576	279,502
June	1,556,507	214,420
July	1,420,136	209,526
Aug.	1,963,304	308,573

Data from Leather and Rubber Division, United States Department of Commerce, Washington, D. C.

World Net Imports of Crude Rubber

Year	U.S.A.	U.K.†	Australia	Belgium	Canada	Czechoslovakia	France	Germany	Italy	Japan	Russia	Rest of the World	Total
1936	475,500	62,700	14,400	9,600	27,900	8,800	56,800	71,800	16,000	61,700	31,000	64,600	831,300
1937	592,528	137,351	19,257	14,969	36,087	13,063	59,959	98,170	23,980	62,205	30,462	72,589	1,115,700
1938													
Jan.	45,596	17,811	617	1,258	1,789	1,102	4,780	6,314	1,809	4,935	693	5,864	90,215
Feb.	40,977	19,149	621	974	615	1,771	5,420	6,959	2,000	3,173	2,341	5,558	86,914
Mar.	42,075	18,134	1,084	961	2,123	1,323	4,823	10,768	1,365	6,222	2,162	5,932	94,750
Apr.	31,870	16,572	647	904	999	920	5,721	6,497	2,397	5,456	4,281	5,820	80,165
May	27,809	17,783	1,087	1,137	2,545	957	5,249	9,595	2,422	3,328	4,163	6,890	79,857
June	26,429	15,314	825	853	3,243	988	4,552	7,478	2,399	2,156	504	6,709	70,189
July	22,209	13,555	1,251	1,106	2,685	636	4,543	6,927	3,641	3,100	1,000*	6,232	66,007

*Estimated. †U. K. figures show gross imports, not net imports. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

Shipments of Crude Rubber from Producing Countries

Year	Malaya including Brunei and Labuan	N.E.I.	Ceylon	India	Burma	North Borneo	Sarawak	Siam	French Indo-China	Total	Philippines and Oceania	Liberia†	Other Africa	South America	Mexican Guayule	Grand Total
1936.....	353,700	309,600	49,700	8,600	5,800	8,200	21,000	34,600	40,800	832,000	1,600*	1,600	4,500	14,700	1,200	855,600
1937.....	469,960	431,674	70,358	9,778	7,232	13,213	25,922	35,551	43,374	1,107,062	1,617*	2,251	5,427	16,288	2,692	1,135,337
1938																
Jan.	30,998	26,466	5,222	841	538	1,307	3,485	2,897	6,088	77,842	138	501	415	938	538	80,372
Feb.	37,166	27,366	5,216	639	770	918	8	3,266	3,070	78,419	125	168	438	1,640	218	81,008
Mar.	33,567	31,268	3,834	532	703	853	1,564	2,837	3,213	78,371	159	108	501	1,883	150	81,172
Apr.	44,744	28,487	1,951	485	842	1,158	1,728	1,583	3,647	84,625	201	308	318	1,085	188	86,725
May	28,011	22,036	2,833	909	561	815	1,648	2,507	3,118	62,438	120	175	284	1,160	229	64,406
June	28,048	24,428	3,693	625	693	643	2,441	3,906	4,776	69,253	198	110	353	809	150	70,873
July	26,735	35,035	3,861	601	482	937	2,057	4,707	5,139	79,554	126	311	373	722	223	81,307
Aug.	33,618	22,988	4,360	654	306	728	965	4,793	3,838	72,250	150*	125	350*	1,118	200*	74,193

*Estimated. Source: *Statistical Bulletin of the International Rubber Regulation Committee.*

★

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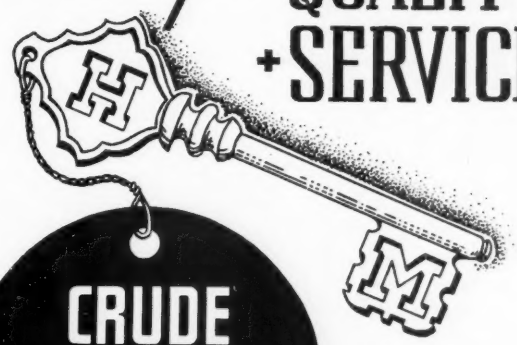

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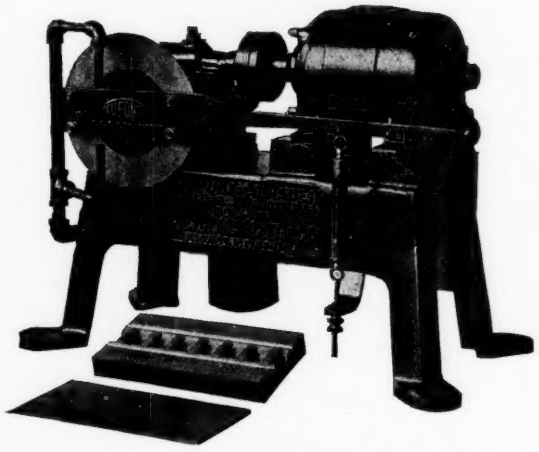

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United States Statistics

Imports for Consumption of Crude and Manufactured Rubber

	July, 1938		Seven Months Ended July, 1938	
UNMANUFACTURED—*Free*	Quantity	Value	Quantity	Value
Liquid latex (solids)....*lb.*	1,420,136	$209,526	16,038,042	$2,382,107
Jelutong or pontianak....*lb.*	1,946,586	267,491	13,502,453	2,081,819
Balata ....*lb.*	114,375	16,130	684,054	101,978
Gutta percha ....*lb.*	20,681	16,904	402,556	86,035
Guayule ....*lb.*	500,000	49,099	3,799,708	452,096
Siak ....*lb.*	22,400	2,759	138.338	16,460
Scrap and reclaimed....*lb.*	219,780	4,958	3,124,158	46,604
Totals	4,243,958	$566,867	37,689,309	$5,167,099
Misc. rubber (above), 1,000 *lbs.*	4,244	$566,867	37,689	$5,167,099
Crude rubber....1,000 *lbs.*	48,768	5,723,381	517,306	72,082,364
Totals ....1,000 *lbs.*	53,012	$6,290,248	554,995	$77,249,463
Chicle, crude ....*lb.*	116,992	$33,159	6,002,310	$1,777,772
MANUFACTURED—*Dutiable*				
Rubber tires ....*no.*	1,865	$2,708	12,903	$44,710
Rubber boots, shoes, and overshoes ....*prs.*	6,624	754	43,522	8,243
Rubber soled footwear with fabric uppers ....*prs.*	70,348	16,023	509,960	113,311
Golf balls ....*no.*	40,188	5,066	440,409	44,217
Lawn tennis balls....*no.*	21,568	2,709	442,328	43,427
Other rubber balls....*no.*	100,078	3,458	1,698,737	60,537
Other rubber toys ....*lb.*	12,932	2,509	201,965	31,503
Hard rubber combs ....*no.*	56,520	3,812	354,260	24,156
Other manufactures of hard rubber	.....	1,506	.....	10,158
Friction or insulating tape *lb.*	5,002	284	52,527	2,906
Belts, hose, packing, and insulating material	.....	3,833	.....	42,342
Druggists' sundries of soft rubber	.....	2,623	.....	36,470
Inflatable swimming belts, floats, etc. ....*no.*	22,782	2,960	384,511	32,125
Other rubber and gutta percha manufactures....*lb.*	44,968	12,724	482,509	120,789
Totals	.....	$60,969	.....	$614,894

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber ....*lb.*	941,670	$127,522	6,625,573	$939,287
Balata ....*lb.*	57,890	19,992	291,673	86,751
Other rubber, rubber substitutes and scrap....*lb.*	8,613	3,318	100,660	14,311
Rubber manufactures (including toys)	.....	1,080	.....	7,623
Totals	.....	$151,912	.....	$1,047,972

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed ....*lb.*	1,612,622	$83,440	8,820,805	$486,387
Scrap ....*lb.*	3,154,812	67,963	35,355,547	575,705
Cements ....*gal.*	22,626	25,236	207,631	192,895
Rubberized auto cloth..*sq. yd.*	13,407	6,601	178,292	85,490
Other rubberized piece goods and hospital sheeting..*sq. yd.*	121,526	44,600	1,219,953	475,101
Boots ....*prs.*	3,588	7,565	54,184	118,194
Shoes ....*prs.*	13,208	9,175	150,628	76,274
Canvas shoes with rubber soles ....*prs.*	16,632	13,891	294,225	203,510
Heels ....*doz. prs.*	18,449	10,986	237,667	127,563
Soling and top lift sheets.*lb.*	14,291	2,919	211,025	40,369
Gloves and mittens..*doz. prs.*	6,523	13,862	55,372	114,572
Water bottles and fountain syringes ....*no.*	26,375	9,959	137,711	46,880
Other druggists' sundries...	.....	46,910	.....	321,302
Gum rubber clothing....*doz.*	34,187	58,033	195,402	372,008
Balloons ....*gross*	44,532	35,011	277,564	198,191
Toys and balls....	.....	8,250	.....	60,176
Bathing caps ....*doz.*	4,294	8,501	31,718	65,430
Bands ....*lb.*	19,350	7,188	152,002	59,134
Erasers ....*lb.*	34,818	15,871	190,809	107,238
Hard rubber goods				
Electrical battery boxes.*no.*	20,459	14,283	127,955	89,183
Other electrical ....*lb.*	41,266	8,105	229,052	49,158
Combs, finished....*doz.*	29,568	10,265	140,000	57,193
Other hard rubber goods..	.....	6,745	.....	100,001
Tires				
Truck and bus casings..*no.*	22,153	410,652	133,520	2,589,213
Other auto casings....*no.*	48,187	523,697	351,083	3,631,100
Tubes, auto ....*no.*	45,548	80,167	314,161	521,166
Other casings and tubes.*no.*	6,465	58,886	44,141	352,505
Solid tires for automobiles and motor trucks....*no.*	130	6,732	1,883	53,147
Other solid tires....*lb.*	6,028	1,748	308,388	56,585
Tire sundries and repair materials	.....	60,113	.....	403,295
Rubber and friction tape..*lb.*	29,414	9,419	368,420	113,829
Fan belts for automobiles.*lb.*	48,903	23,480	311,944	164,205
Other rubber and balata belts ....*lb.*	336,655	157,464	1,711,439	867,336
Garden hose ....*lb.*	71,278	11,968	416,483	79,379
Other hose and tubing....*lb.*	325,355	140,094	2,530,252	964,586
Packing ....*lb.*	83,759	35,502	620,568	294,449
Mats, matting, flooring, and tiling ....*lb.*	54,233	9,017	517,365	78,715
Thread ....*lb.*	70,121	41,770	286,901	192,503
Gutta percha manufactures.*lb.*	39,688	14,473	482,009	154,565
Other rubber manufactures..	.....	97,390	.....	711,066
Totals	.....	$2,197,931	.....	$15,249,598

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	June, 1938		Three Months Ended June, 1938	
UNMANUFACTURED	Quantity	Value	Quantity	Value
Crude rubber, etc. ....*lb.*	7,264,134	$1,001,382	15,203,628	$2,191,062
Gutta percha ....*lb.*	4,480	559	6,651	2,470
Rubber, recovered....*lb.*	579,800	31,287	1,784,600	93,110
Rubber, powdered, and gutta percha scrap ....*lb.*	398,700	6,236	1,024,400	13,843
Balata ....*lb.*	2,641	485	7,918	1,709
Rubber substitute ....*lb.*	16,200	4,593	109,300	17,419
Totals	8,265,955	$1,044,542	18,136,497	$2,319,613
PARTLY MANUFACTURED				
Hard rubber comb blanks...	.....	$79	.....	$1,187
Hard rubber, n. o. s.....*lb.*	2,918	1,122	7,321	4,447
Rubber thread not covered.*lb.*	3,293	2,555	11,967	9,055
Totals	6,211	$3,756	19,288	$14,689
MANUFACTURED				
Bathing shoes ....*pairs*	4,214	$925	39,575	$9,125
Belting	.....	11,050	.....	24,289
Hose	.....	9,141	.....	27,283
Packing	.....	6,207	.....	16,113
Boots and shoes....*pairs*	1,080	784	5,810	4,977
Canvas shoes with rubber soles ....*pairs*	4,246	1,942	96,306	29,747
Clothing, including waterproofed	.....	4,186	.....	14,371
Raincoats ....*number*	598	1,803	4,370	12,931
Gloves ....;....*dozen pairs*	357	945	1,117	2,546
Hot water bottles....	.....	71	.....	734
Liquid rubber compound....	.....	5,688	.....	14,706
Tires, bicycle....*number*	11,856	7,271	48,709	25,869
Pneumatic ....*number*	1,988	22,396	5,899	63,995
Inner tubes ....*number*	694	1,962	1,806	4,172
Solid for automobiles and motor trucks....*number*	17	1,409	65	3,126
Other solid tires....	.....	771	.....	2,082
Mats and matting....	.....	3,478	.....	12,590
Cement	.....	4,878	.....	16,385
Golf balls ....*dozens*	6,616	14,667	20,761	45,002
Heels ....*pairs*	3,256	165	11,664	757
Other rubber manufactures..	.....	93,127	.....	299,501
Totals	.....	$192,866	.....	$630,301
Totals, rubber imports..	.....	$1,241,164	.....	$2,964,603

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Waste rubber	$9,570	.....	$15,803	.....
MANUFACTURED				
Belting	42,743	.....	153,511	.....
Canvas shoes with rubber soles	111,953	.....	374,836	.....
Boots and shoes	165,994	.....	410,953	.....
Clothing, including waterproofed	45,681	.....	114,168	.....
Heels	16,116	.....	44,070	.....
Hose	19,588	.....	64,957	.....
Soles	12,458	.....	36,398	.....
Tires, pneumatic	571,524	.....	1,741,962	.....
Not otherwise provided for	18	.....	18	.....
Inner tubes	52,316	.....	161,249	.....
Other rubber manufactures.	72,845	$2,411	212,732	$30,586
Totals	$1,111,236	$2,411	$3,314,854	$30,586
Totals, rubber exports..	$1,120,806	$2,411	$3,330,657	$30,586

Imports by Customs Districts

	August, 1938† *Crude Rubber		August, 1937† *Crude Rubber	
	Pounds	Value	Pounds	Value
Massachusetts	8,500,955	$1,219,355	14,327,408	$2,763,890
New York	55,342,158	6,640,373	73,436,323	13,699,700
Philadelphia	562,984	51,685	1,071,833	193,767
Maryland	485,099	50,120	5,736,249	1,218,166
Georgia	.....	.....	223,781	40,896
Virginia	873,600	103,034	.....	.....
Mobile	276,198	28,296	2,339,887	456,434
New Orleans	2,603,405	394,850	5,525,259	1,106,556
Los Angeles	1,869,673	227,108	8,843,696	1,886,673
San Francisco	817,701	99,367	498,166	92,786
Oregon	11,200	1,664	15,680	3,079
Michigan	.....	.....	4,972	1,206
Ohio	56,000	6,682	43,898	15,055
Colorado	112,000	16,555	280,000	51,777
Totals	71,510,973	$8,839,089	112,347,152	$21,529,985

*Crude rubber including latex dry rubber content. †Correction: Figures given on page 80 of Oct. issue are for July, not June.